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DRINKING WATER SURVEILLANCE PROGRAM

**MARATHON
WELL SUPPLY**

REPORT FOR 1991 AND 1992

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**MARATHON WELL SUPPLY
DRINKING WATER SURVEILLANCE PROGRAM
REPORT FOR 1991 AND 1992**

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EXECUTIVE SUMMARY

DRINKING WATER SURVEILLANCE PROGRAM

MARATHON WELL SUPPLY 1991 AND 1992 REPORT

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

The Marathon well supply is a groundwater source consisting of 6 wells in several aquifers. Raw water from these wells is pumped directly into the distribution and to a reservoir without treatment or disinfection. This supply has a maximum pumping capacity of $9.8 \times 1000 \text{ m}^3/\text{day}$. The Marathon well supply serves a population of approximately 5,100.

Water from six wells, one reservoir and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

Table A is a summary of all results by group.

No known health related guidelines were exceeded.

The Marathon well supply, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A '.' INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	WELL 1			WELL 2			WELL 3			WELL 4		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	.	.	.	2	0	0	10	0	0	6	0	0
CHEMISTRY (FIELD)	2	2	100	6	6	100	13	13	100	7	7	100
CHEMISTRY (LABORATORY)	23	17	73	55	38	69	190	136	71	94	69	73
METALS	24	11	45	72	18	25	192	61	31	96	21	21
CHLOROAROMATICS	14	0	0	42	0	0	56	0	0	56	0	0
CHLOROPHENOLS	6	0	0	18	0	0	39	0	0	24	0	0
PESTICIDES AND PCB	35	0	0	93	0	0	141	0	0	127	0	0
PHENOLICS	1	0	0	3	0	0	8	0	0	4	0	0
POLYAROMATIC HYDROCARBONS	.	.	.	17	0	0	17	0	0	17	0	0
SPECIFIC PESTICIDES	6	0	0	18	0	0	44	0	0	24	0	0
VOLATILES	.	.	.	60	0	0	236	0	0	118	0	0
RADIONUCLIDES	.	.	.	.	.	.	7	2	28	7	1	14
TOTAL	111	30		386	62		953	212		386	98	

TABLE A
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

SUMMARY TABLE BY SCAN

A POSITIVE VALUE DENOTES THAT THE RESULT IS GREATER THAN THE STATISTICAL LIMIT OF DETECTION AND IS QUANTIFIABLE
A "-" INDICATES THAT NO SAMPLE WAS TAKEN

SCAN	WELL 5			WELL 6			RESERVOIR TREATED			DIST. SYSTEM HOWE ST		
	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE	TESTS	POSITIVE	%POSITIVE
BACTERIOLOGICAL	8	0	0	6	0	0	33	8	24	21	7	33
CHEMISTRY (FIELD)	12	12	100	6	6	100	21	21	100	25	25	100
CHEMISTRY (LABORATORY)	166	122	73	67	54	80	284	199	70	339	272	80
METALS	168	39	23	72	19	26	263	80	30	368	145	39
CHLOROAROMATICS	56	0	0	42	0	0	126	0	0	126	0	0
CHLOROPHENOLS	27	0	0	12	0	0	57	0	0	-	-	-
PESTICIDES AND PCB	140	0	0	104	0	0	277	0	0	200	0	0
PHENOLICS	7	0	0	3	0	0	10	0	0	-	-	-
POLYAROMATIC HYDROCARBONS	17	0	0	-	-	-	34	0	0	34	0	0
SPECIFIC PESTICIDES	32	0	0	12	0	0	62	0	0	-	-	-
VOLATILES	207	0	0	91	0	0	356	0	0	325	0	0
RADIONUCLIDES	14	2	14	7	1	14	14	2	14	-	-	-
TOTAL	854	175		422	80		1,537	310		422	449	

DRINKING WATER SURVEILLANCE PROGRAM

MARATHON WELL SUPPLY 1991 AND 1992 REPORT

INTRODUCTION

The Drinking Water Surveillance Program (DWSP) for Ontario is a monitoring program providing immediate, reliable, current information on drinking water quality. The DWSP officially began in April 1986 and is designed to include all municipal supplies in Ontario. In 1991, 96 supplies and in 1992, 109 supplies were being monitored.

Appendix A has a full description of the DWSP.

The DWSP was initiated for the Marathon well supply in May 1991. This is the first published DWSP report.

PLANT DESCRIPTION

The Marathon well supply is a groundwater source consisting of 6 wells in several aquifers. Raw water from these wells is pumped directly into the distribution and to a reservoir without treatment or disinfection. This supply has a maximum pumping capacity of $9.8 \times 1000 \text{ m}^3/\text{day}$. The Marathon well supply serves a population of approximately 5,100.

The sample day flows ranged from $2.4 \times 1000 \text{ m}^3/\text{day}$ to $5.8 \times 1000 \text{ m}^3/\text{day}$.

General information for the water supply is presented in Table 1.

SAMPLING AND ANALYSES

Stringent DWSP sampling protocols were followed to ensure that all samples were collected in a uniform manner (see Appendix B).

Sample lines at the wells and reservoir were flushed prior to sampling to ensure that the water obtained was indicative of its origin and not residual water standing in the sample line.

Supply operating personnel routinely analyzed parameters for process control (see Table 2 if data is provided).

At all distribution system locations, two types of samples were obtained, a standing and a free flow. The standing sample consisted of water that had been in the household plumbing and service

connection for a minimum of six hours. These samples were used to make an assessment of the change in the levels of inorganic compounds and metals due to leaching from, or deposition on, the plumbing system. The only analyses carried out on the standing samples, therefore, were laboratory chemistry and metals. The free flow sample represented fresh water from the distribution system main, since the sample tap was flushed for five minutes prior to sampling.

Water from six wells, a reservoir and at one location in the distribution system was sampled for the presence of approximately 180 parameters. Parameters were divided into the following groups: bacteriological, inorganic and physical (laboratory chemistry, field chemistry and metals), organic (chloroaromatics, chlorophenols, pesticides and PCB, phenolics, polyaromatic hydrocarbons and volatiles) and radiological (radionuclides). Most laboratory analyses were conducted at the Ministry of the Environment and Energy facilities in Rexdale, Ontario. Radionuclides were analyzed by the Ministry of Labour.

RESULTS

Field measurements were recorded on the day of sampling and were entered onto the DWSP database as submitted by plant personnel.

Table 3 (when data is provided) contains information on flow rates.

Table 4 is a summary of all results by parameter and by water type. If a parameter was not detected, the total number of negative sample results is given. In contrast, if a parameter was detected at any location, the detailed results for all samples are provided.

Positive denotes that the result is greater than the statistical limit of detection established by the Ministry of the Environment and Energy laboratory staff and is quantifiable. Trace (<T) denotes that the level measured is greater than the lowest value detectable by the method but lies so close to the detection limit that it cannot be confidently quantified.

Table 5 lists all parameters analyzed in the DWSP.

Associated guidelines and detection limits are also supplied on Tables 4 and 5. Parameters are listed alphabetically within each scan.

DISCUSSION

GENERAL

Water quality was judged by comparison with the Ontario Drinking Water Objectives publication (ODWOs). When an Ontario Drinking Water Objective (ODWO) was not available, guidelines/limits from other agencies were used. These guidelines were obtained from the Parameter Listing System database.

The guidelines are evaluated on the results from the free flowing samples. Standing samples in the distribution system can show elevated concentrations in certain metals if the water is corrosive or if the standing time is excessive. Flushing the tap until the water achieves the coolest temperature will ensure that the water used for consumption will contain minimum concentrations of metals.

IN REPORTS FOR GROUND WATER SUPPLIES, WHERE:

- TREATMENT CAN BE LIMITED TO DISINFECTION;
- MANY WELLS CAN FEED INTO THE DISTRIBUTION SYSTEM INDEPENDENTLY; AND
- TREATED SAMPLES, WHEN AVAILABLE, ARE TAKEN FROM RESERVOIRS;

THIS SECTION WILL DISCUSS:

- RESULTS FROM RAW, TREATED AND DISTRIBUTED WATERS;
- THOSE PARAMETERS WITH CONCENTRATIONS ABOVE GUIDELINE VALUES; AND
- POSITIVE ORGANIC PARAMETERS DETECTED.

In this report comments are combined for all sample locations for each parameter discussed. The water in the distribution system can be a mixture from many sources.

BACTERIOLOGICAL

Guidelines for bacteriological sampling and testing of a supply are developed to maintain a proper supervision of its bacteriological quality. Routine monitoring programs usually require that multiple samples be collected in a given system. Full interpretation of bacteriological quality cannot be made on the basis of single samples. Standard plate count was the only bacteriological analysis conducted on the treated and distributed water. No results were above the guideline.

INORGANIC & PHYSICAL

CHEMISTRY (LABORATORY)

Elevated conductivity is often associated with high hardness levels.

Conductivity exceeded the European Economic Community Aesthetic Guideline Level of 400 umho/cm in 30 of 49 raw, and distributed water samples with a maximum reported value of 514 umho/cm.

The ODWOs indicate that a hardness level of between 80 and 100 mg/L as calcium carbonate for domestic waters provides an acceptable balance between corrosion and encrustation. Water supplies with a hardness greater than 200 mg/L are considered poor and possess a tendency to form scale deposits and result in excessive soap consumption.

Hardness exceeded the ODWO Recommended Operational Guideline of 80-100 mg/L and also exceeded 200 mg/L in all 49 raw, and distributed water samples with a maximum reported value of 329 mg/L.

METALS

Iron exceeded the ODWO Aesthetic Objective of 300 ug/L in 2 of 49 raw and distributed water samples with a maximum reported value of 860 ug/L.

ORGANIC

CHLOROAROMATICS

The results of the chloroaromatic scan showed that none were detected above trace levels.

CHLOROPHENOLS

The results of the chlorophenol scan showed that one parameter was detected at a trace level in one sample from the reservoir.

PESTICIDES AND PCB

The results of the pesticide and PCB scan showed that none were detected above trace levels.

PHENOLICS

The results of the phenolic test showed that none were detected above trace levels.

POLYAROMATIC HYDROCARBONS

The results of the polyaromatic hydrocarbon scan showed that none were detected.

SPECIFIC PESTICIDES

The results of the specific pesticide scan showed that none were detected.

VOLATILES

The detection of benzene, ethylbenzene, toluene and xylenes at low, trace levels may be a laboratory artifact derived from the analytical methodology. Trace levels of styrene are considered to be laboratory artifacts resulting from the sample shipping containers.

The results of the volatile scan showed that none were detected above trace levels.

No trihalomethanes (THMs) were detected in the distribution samples since there was no disinfection with chlorine.

RADIOLOGICAL

RADIONUCLIDES

There are more than 200 radionuclides, some of which occur naturally and others which originate from the activities of society. The radionuclides currently of greater interest from a health view-point are tritium, strontium-90, iodine-131, cesium-137 and radium-226. The gross beta and gross alpha determinations are suitable for preliminary screening except for tritium which must be measured separately. Radionuclides are measured in becquerels per litre (Bq/L). No results were above the available guidelines.

CONCLUSIONS

No known health related guidelines were exceeded.

The Marathon well supply, for the sample years 1991 and 1992, produced good quality water and this was maintained in the distribution system.

The current MOEE policy (#15-15) requires that ground waters be provided with a minimum treatment of disinfection. This was not provided by the Marathon well supply; however, a variance from the treatment requirement may have been granted.

TABLE 1

DRINKING WATER SURVEILLANCE PROGRAM

PLANT GENERAL REPORT

PLANT NAME: MARATHON WELL SUPPLY
WORKS #: 220000255
UTM #: 165384545373961

DISTRICT: THUNDER BAY
REGION: NORTHWEST
DISTRICT OFFICER: D.W. MURRAY

WORKS AND OPERATIONS
MANAGER: DOUG BROWN

ADDRESS: 4 HEMLO DRIVE
MARATHON, ONTARIO
POT 2E0 BAG "TM"
807-229-1340

MUNICIPALITY: MARATHON
AUTHORITY: MUNICIPAL

PLANT INFORMATION

PLANT VOLUME:	2.200	(X 1000 M3)
DESIGN CAPACITY:	9.800	(X 1000 M3/DAY)
RATED CAPACITY:	9.800	(X 1000 M3/DAY)

MUNICIPALITY	POPULATION
-----	-----
MARATHON	5,065

TABLE 3
 DRINKING WATER SURVEILLANCE PROGRAM MARATHON WELL SUPPLY
 SAMPLE DAY CONDITIONS FOR 1991 AND 1992

DATE	DELAY * TIME(HRS)	FLOW (1000M3)
91 MAY 22	.00	.
91 JUN 19	.00	5.820
91 JUL 17	.00	2.752
91 AUG 21	.00	.
91 SEP 18	.00	2.410
91 OCT 22	.00	3.970
91 NOV 22	.00	.
92 JAN 22	.00	.
92 FEB 19	.00	3.170
92 MAY 20	.00	3.970
92 AUG 18	.00	3.100
92 DEC 01	.00	3.400

* THE DELAY TIME BETWEEN THE RAW AND TREATED WATER SAMPLING, SHOULD ESTIMATE THE RETENTION TIME.

KEY TO TABLE 4 and 5

- A ONTARIO DRINKING WATER OBJECTIVES (ODWO)
 1. Maximum Acceptable Concentration (MAC)
 1+. MAC for Total Trihalomethanes
 2. Interim Maximum Acceptable Concentration (IMAC)
 3. Aesthetic Objective (AO)
 3*. AO for Total Xylenes
 4. Recommended Operational Guideline
 5. Health Related Guidance Value
- B HEALTH & WELFARE CANADA (H&W)
 1. Maximum Acceptable Concentration (MAC)
 2. Proposed MAC
 3. Interim MAC
 4. Aesthetic Objective (AO)
- C WORLD HEALTH ORGANIZATION (WHO)
 1. Guideline Value (GV)
 2. Tentative GV
 3. Aesthetic GV
- D US ENVIRONMENTAL PROTECTION AGENCY (EPA)
 1. Maximum Contaminant Level (MCL)
 2. Suggested No-Adverse Effect Level (SNAEL)
 3. Lifetime Health Advisory
 4. EPA Ambient Water Quality Criteria
- F EUROPEAN ECONOMIC COMMUNITY (EEC)
 1. Health Related Guideline Level
 2. Aesthetic Guideline Level
 3. Maximum Admissable Concentration (MADC)
- G CALIFORNIA STATE DEPARTMENT OF HEALTH-GUIDELINE VALUE
- I NEW YORK STATE AMBIENT WATER GUIDELINE
- N/A NONE AVAILABLE

LABORATORY RESULTS, REMARK DESCRIPTIONS

. No Sample Taken

BDL Below Minimum Measurement Amount

<T Greater Than Detection Limit But Not Confident
(SEE INTERPRETATION OF RESULTS ABOVE)

> Results Are Greater Than The Upper Limit

<=> Approximate Result

!48 No Data: Sample Age Exceeded 48 Hours

!AR No Data: No Numeric Results

!AW No Data: Analysis Withdrawn

!BT No Data: Sample Broken In Transit

!CS No Data: Contamination Suspected

!EF No Data: Laboratory Equipment Failure

!IR No Data: Insufficient Sample

!IS No Data: Insufficient Sample

!LA No Data: Laboratory Accident

!NP No Data: No Procedure

!NR No Data: Sample Not Received

!OP No Data: Obscured Plate

!PE No Data: Procedure Error: Sample Discarded

!PR No Data: Preservative Required

!QU No Data: Quality Control Unacceptable

!RE No Data: Received Empty

!RO No Data: No Numeric Results

!SM No Data: Sample Missing

!SS No Data: Sample Improperly Preserved

!U No Data: Sample Unsuitable For Analysis

!UB No Data: Bottle Broken

!UN No Data: Result Unreliable

!UR	No Data: Unpreserved Sample Required
A	Approximate Value
A3C	Approximate, Total Count Exceeded 300 Colonies
A>	Approximate Value, Exceeded Normal Range
APS	Additional Peak, Less Than, Not Priority Pollutant
ARO	Additional Information In Laboratory Report
CRO	Calculated Result Only
NAF	Not All Required Tests Found
RID	Ioncal Calculated on Incomplete Data Set
RMP	P and M-Xylene Not Separated
RRR	Result Obtained by Repeat Analysis
RRV	Rerun Verification
SFA	Sample Filtered: Filtrate Analyzed
SIL	Sample Incorrectly Labelled
SPS	Several Peaks, Small, Not Priority Pollutant
U48	Unreliable: Sample Age Exceeded 48 Hours
UAL	Unreliable: Sample Age Exceeded Limit
UAU	Unreliable: Sample Age Unknown
UCS	Unreliable: Contamination Suspected
WSD	Wrong Sample Description On Bottle

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOME ST FREE FLOW
BACTERIOLOGICAL							
FECAL COLIFORM MF (CT/100ML)	DET'N LIMIT = 0			GUIDELINE = 0 (A1)			
16 SAMPLES	BDL	BDL	BDL	BDL	BDL	.	.
TOTAL COLIFORM MF (CT/100ML)	DET'N LIMIT = 0			GUIDELINE = 5/100ML (A1)			
16 SAMPLES	BDL	BDL	BDL	BDL	BDL	.	.
STANDRD PLATE CNT MF (CT/ML)	DET'N LIMIT = 0			GUIDELINE = 500 (A3)			
1991 JUL	.	.	.	.	.	3	5
1991 SEP	.	.	.	.	.	1	1
1991 OCT	.	.	.	.	.	14	1
1992 JAN	.	.	.	.	.	5	.
1992 MAY	.	.	.	.	.	1	11
1992 AUG	.	.	.	.	.	.	4
1992 DEC	.	.	.	.	.	3	116

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM HOWE ST STANDING					
BACTERIOLOGICAL					
TOTAL COLIFORM MF (CT/100ML)	DET'N LIMIT = 0	GUIDELINE = 5/100ML (A1)			
16 SAMPLES					
STANDRD PLATE CNT MF (CT/ML)	DET'N LIMIT = 0	GUIDELINE = 500 (A3)			
1991 JUL	5				

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHEMISTRY (FIELD)							
FLD PH (OMNSLESS)	DET'N LIMIT = N/A			GUIDELINE = 6.5-8.5 (A4)			
1991 MAY	.	7.400	7.400	7.500	.	7.400	7.400
1991 JUN	.	.	7.500	.	.	7.500	7.600
1991 JUL	.	.	7.500	7.600	.	7.500	7.700
1991 AUG	.	.	7.500	7.500	.	7.600	.
1991 SEP	.	.	7.600	7.500	.	7.600	7.600
1991 OCT	.	.	7.600	.	.	7.600	7.700
1991 NOV	.	.	7.300	7.500	.	7.500	7.500
1992 JAN	.	.	.	.	7.400	7.800	.
1992 FEB	7.400	7.300	.	.	.	7.400	7.400
1992 MAY	.	7.300	7.400	.	.	7.500	7.200
1992 AUG	.	.	7.500	7.300	7.400	7.400	7.600
1992 DEC	.	.	.	7.300	7.300	7.500	7.400
FLD TEMPERATURE (DEG.C)							
		DET'N LIMIT = N/A	GUIDELINE = 15 (A3)				
1991 MAY	.	5.500	.	5.500	.	5.500	6.000
1991 JUN	.	8.000	6.000	.	.	7.500	7.500
1991 JUL	.	.	7.600	7.500	.	7.500	7.400
1991 NOV	.	.	5.100	4.800	.	6.500	6.500
1992 JAN	.	.	5.500	.	4.500	4.500	.
1992 FEB	4.900	4.700	.	.	.	3.900	4.900
1992 MAY	.	5.300	5.300	.	.	5.400	5.500
1992 AUG	.	.	5.000	4.500	4.500	6.000	5.500
1992 DEC	.	.	5.100	4.000	4.800	5.000	5.900

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

CHEMISTRY (FIELD)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)	
FLD PH (DMNSLESS)					
1991 JUL	7.700	.	.	.	.
1991 AUG	7.400	.	.	.	.
1991 SEP	7.500	.	.	.	.
1991 OCT	7.500	.	.	.	.
1992 JAN	7.600	.	.	.	.
FLD TEMPERATURE (DEG.C)		DET'N LIMIT = N/A		GUIDELINE = 15 (A3)	
1991 JUL	10.100	.	.	.	.
1992 JAN	5.000	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHEMISTRY (LABORATORY).							
ALKALINITY (MG/L)							
		DET'N LIMIT = 0.2		GUIDELINE = 30-500 (A4)			
1991 MAY	.	180.300	.	173.100	.	166.600	180.200
1991 JUN	123.200	.	122.000	.	.	131.300	135.200
1991 JUL	.	166.500	.	174.200	.	168.100	173.900
1991 AUG	.	182.300	.	178.100	.	172.200	182.100
1991 SEP	.	181.300	.	178.800	.	173.000	181.000
1991 OCT	.	184.700	158.100	.	.	175.400	184.800
1991 NOV	.	176.600	.	170.700	.	171.300	178.700
1992 JAN	.	.	153.500	.	174.300	168.300	154.000
1992 FEB	!IS	.	.	.	.	151.200	139.500
1992 MAY	148.300	156.700	.	.	.	174.500	164.900
1992 AUG	.	164.200	.	174.900	177.600	176.500	177.900
1992 DEC	.	.	161.400	184.700	184.300	179.300	183.200
CALCIUM (MG/L)							
		DET'N LIMIT = 0.20		GUIDELINE = 100 (F2)			
1991 MAY	.	62.800	.	61.400	.	60.000	68.000
1991 JUN	48.100	.	43.300	.	.	47.600	52.300
1991 JUL	.	48.600	.	56.600	.	55.000	57.200
1991 AUG	.	65.000	.	61.800	.	63.200	63.200
1991 SEP	.	58.800	.	60.800	.	59.200	60.000
1991 OCT	.	68.000	54.600	.	.	62.400	69.100
1991 NOV	.	63.300	.	56.100	.	63.500	63.400
1992 JAN	.	.	62.100	.	68.000	66.500	65.600
1992 FEB	!IS	.	.	.	.	58.400	54.600
1992 MAY	50.400	51.850	.	65.750	73.100	63.300	57.400
1992 AUG	.	59.500	.	56.100	61.300	70.800	72.400
1992 DEC	.	.	51.300	.	.	54.800	66.800
CYANIDE (MG/L)							
		DET'N LIMIT = 0.001		GUIDELINE = 0.2 (A1)			
1991 MAY	.	BOL	.	BOL	.	BOL	.
1991 JUN	BOL	.	BOL	.	.	BOL	.
1991 JUL	.	BOL	.	BOL	.	BOL	.
1991 AUG	.	.009	.	BOL	.	!SM	.
1991 SEP	.	BOL	.	BOL	.	BOL	.
1991 OCT	.	BOL	BOL	.	.	BOL	.
1991 NOV	.	BOL	.	BOL	.	.	.
1992 JAN	.	.	.	.	.	BOL	.
1992 FEB	.	.	.	.	.	BOL	.
1992 MAY	.	.	.	.	.	BOL	.
1992 AUG	.	.	.	!SM	.	BOL	.
1992 DEC	.	.	.	.	!NR	BOL	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.2	GUIDELINE = 30-500 (A4)	
ALKALINITY (MG/L)				
1991 JUL	176.500	.	.	.
1991 AUG	184.200	.	.	.
1991 SEP	183.300	.	.	.
1991 OCT	188.100	.	.	.
CALCIUM (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 100 (F2)	
1991 JUL	58.300	.	.	.
1991 AUG	65.200	.	.	.
1991 SEP	61.200	.	.	.
1991 OCT	70.700	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOME ST FREE FLOW
CHEMISTRY (LABORATORY)							
CHLORIDE (MG/L)	DET'N LIMIT = 0.20		GUIDELINE = 250 (A3)				
1991 MAY	.	33.500	20.800	17.300	.	20.200	33.600
1991 JUN	28.300	.	.	.	.	19.800	32.700
1991 JUL	.	6.100	.	14.600	.	18.100	13.700
1991 AUG	.	22.500	.	14.900	.	23.600	22.700
1991 SEP	.	14.200	.	10.300	.	20.900	13.900
1991 OCT	.	36.000	17.100	.	.	21.600	35.900
1991 NOV	.	18.500	.	6.400	.	23.700	18.300
1992 JAN	.	.	41.600	.	42.200	38.600	40.700
1992 FEB	13.000	11S	.	.	.	39.300	43.100
1992 MAY	29.500	14.600	.	.	.	30.800	28.600
1992 AUG	.	17.700	.	18.500	48.200	41.900	46.100
1992 DEC	.	.	22.600	24.800	44.300	33.300	42.700
COLOUR (HZU)							
	DET'N LIMIT = 0.50		GUIDELINE = 5 (A3)				
1991 MAY	.	.500 <T	.500 <T	.500 <T	.	.500 <T	.500 <T
1991 JUN	.500 <T	.	.500 <T	.	.	.500 <T	.500 <T
1991 JUL	.	BDL	.	.500 <T	.	.500 <T	.500 <T
1991 AUG	.	.500 <T	.	.500 <T	.	1.000 <T	.500 <T
1991 SEP	.	3.500	.	1.500	.	1.000 <T	1.000 <T
1991 OCT	.	1.000 <T	BDL	.	.	BDL	BDL
1991 NOV	.	.500 <T	.	BDL	.	.500 <T	.500 <T
1992 JAN	.	.	.500 <T	.	1.000 <T	.500 <T	BDL
1992 FEB	.500 <T	11S	.	.	.	BDL	BDL
1992 MAY	.500 <T	.500 <T	.	.	.	.500 <T	.500 <T
1992 AUG	.	1.000 <T	.500 <T	.500 <T	.500 <T	.500 <T	.500 <T
1992 DEC	.	.	.500 <T	BDL	.500 <T	.500 <T	1.000 <T
CONDUCTIVITY (UMHO/CM)							
	DET'N LIMIT = 1.0		GUIDELINE = 400 (F2)				
1991 MAY	.	447	.	383	.	380	446
1991 JUN	425	.	377	.	.	395	380
1991 JUL	.	342	.	391	.	389	389
1991 AUG	.	422	.	391	.	409	422
1991 SEP	.	397	.	380	.	404	396
1991 OCT	.	485	370	.	.	418	483
1991 NOV	.	408	451	356	.	416	412
1992 JAN	.	.	.	.	494	469	451
1992 FEB	341	11S	.	.	.	481	481
1992 MAY	403	345	.	.	.	436	408
1992 AUG	.	386	.	409	514	493	507
1992 DEC	.	.	386	435	495	452	488

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOME ST
STANDING

CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.20	GUIDELINE = 250 (A3)	
CHLORIDE (MG/L)				
1991 JUL	14.400	.	.	.
1991 AUG	22.300	.	.	.
1991 SEP	13.400	.	.	.
1991 OCT	35.600	.	.	.

COLOUR (HZU)		DET'N LIMIT = 0.50	GUIDELINE = 5 (A3)	
1991 JUL	.500 <T	.	.	.
1991 AUG	1.000 <T	.	.	.
1991 SEP	1.500	.	.	.
1991 OCT	.500 <T	.	.	.

CONDUCTIVITY (UMHO/CM)		DET'N LIMIT = 1.0	GUIDELINE = 400 (F2)	
1991 JUL	393	.	.	.
1991 AUG	424	.	.	.
1991 SEP	398	.	.	.
1991 OCT	489	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHEMISTRY (LABORATORY)							
DISS ORG CARBON (MG/L)	DET'N LIMIT = 0.10		GUIDELINE = 5.0 (A3)				
1991 MAY	.	.700	.	.600	.	.700	.600
1991 JUN	.600	.	.500	.	.	.700	.600
1991 JUL	.	.600	.	.800	.	.600	.800
1991 AUG	.	.600	.	.800	.	.800	.800
1991 SEP	.	.700	.	.800	.	.700	.800
1991 OCT	.	.700	.500	.	.	.400 <T	.700
1991 NOV	.	.700	.	.600	.	.800	.800
1992 JAN	.	.	.600	.	1.200	.700	.700
1992 FEB	!!S	.	.	.	.	.700	.700
1992 MAY	.500	.600	.	.	.	.700	.700
1992 AUG	.	.600	.	.800	.700	.900	.800
1992 DEC	.	.	.500	.800	.800	.700	.600
FLUORIDE (MG/L)							
	DET'N LIMIT = 0.01		GUIDELINE = 1.5 (A1)				
1991 MAY	.	.060	.	.060	.	.060	.060
1991 JUN	.	.	.100	.	.	.080	.080
1991 JUL	.080	.120	.	.060	.	.080	.080
1991 AUG	.	.080	.	.060	.	.080	.080
1991 SEP	.	.100	.	.080	.	.100	.100
1991 OCT	.	.080	.100	.	.	.060	.080
1991 NOV	.	.060	.	.100	.	.080	.060
1992 JAN	.	.	.080	.	.100	.080	.080
1992 FEB	.080	.100	.	.	.	.080	.060
1992 MAY	.	.120	.	.	.	.080	.100
1992 AUG	.060	.120	.	.060	.100	.100	.080
1992 DEC	.	.	.120	.100	.120	.120	.120
HARDNESS (MG/L)							
	DET'N LIMIT = 0.5		GUIDELINE = 80-100 (A4)				
1991 MAY	.	208.000	143.900	200.000	.	195.000	223.000
1991 JUN	161.900	.	.	.	.	162.100	180.000
1991 JUL	.	163.700	.	186.700	.	181.500	187.700
1991 AUG	.	212.000	.	201.000	.	205.000	208.000
1991 SEP	.	194.000	.	198.000	.	193.000	197.000
1991 OCT	.	222.100	177.300	.	.	202.400	224.800
1991 NOV	.	206.800	.	185.200	.	206.900	208.200
1992 JAN	.	.	204.100	.	222.400	202.100	214.700
1992 FEB	!!S	.	.	.	.	196.000	189.000
1992 MAY	170.000	169.200	.	.	.	207.200	186.600
1992 AUG	.	195.050	.	213.100	236.570	229.390	329.990
1992 DEC	.	.	168.600	190.000	203.000	186.000	216.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM HOME ST STANDING		CHEMISTRY (LABORATORY)		
DISS ORG CARBON (MG/L)		DET'N LIMIT = 0.10	GUIDELINE = 5.0 (A3)	
1991 JUL	1.300	.	.	.
1991 AUG	.800	.	.	.
1991 SEP	.700	.	.	.
1991 OCT	.600	.	.	.
FLUORIDE (MG/L)		DET'N LIMIT = 0.01	GUIDELINE = 1.5 (A1)	
1991 JUL	.060	.	.	.
1991 AUG	.080	.	.	.
1991 SEP	.100	.	.	.
1991 OCT	.080	.	.	.
HARDNESS (MG/L)		DET'N LIMIT = 0.5	GUIDELINE = 80-100 (A4)	
1991 JUL	190.800	.	.	.
1991 AUG	210.000	.	.	.
1991 SEP	199.000	.	.	.
1991 OCT	226.900	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHEMISTRY (LABORATORY)							
IONCAL (DMNSLESS)							
		DET'N LIMIT = N/A		GUIDELINE = N/A			
1991 MAY	.	4.651	.	.163	.	1.551	1.283
1991 JUN	4.106	.	1.976	.	.	3.658 NAF	4.189 NAF
1991 JUL	.	10.280	.	5.635	.	6.082	4.366
1991 AUG	.	1.281 NAF	.	.378 NAF	.	.110 NAF	1.963 NAF
1991 SEP	.	2.144	.	.142	.	2.015	.124
1991 OCT	.	.937	.261	.	.	.157	.254
1991 NOV	.	2.255	.371	2.627	.	2.890	2.237
1992 JAN	.	.	.	.	2.838	4.274	4.931
1992 FEB	4.654	.	.	.	.	3.127	4.151
1992 MAY	.000 NAF	4.245	.	.	.	1.980	3.355
1992 AUG	4.421	2.057	.	2.078	1.999	1.753	1.375
1992 DEC	.	.	4.164	16.410	11.950	13.370	5.010
POTASSIUM (MG/L)							
		DET'N LIMIT = 0.01		GUIDELINE = 10 (F2)			
1991 MAY	.	2.350	.	1.700	.	1.750	2.350
1991 JUN	1.580	.	1.550	.	.	1.700	2.070
1991 JUL	.	2.080	.	1.790	.	1.710	1.760
1991 AUG	.	2.300	.	1.750	.	1.750	2.150
1991 SEP	.	2.050	.	1.700	.	1.750	2.150
1991 OCT	.	2.170	1.560	.	.	1.710	2.220
1991 NOV	.	1.780	.	2.000	.	1.830	1.820
1992 JAN	.	.	1.570	.	1.900	1.520	1.800
1992 FEB	1.530	.	.	.	.	1.900	1.900
1992 MAY	1.560	1.510	.	.	.	1.810	1.620
1992 AUG	.	2.216	.	1.742	2.042	2.006	2.028
1992 DEC	.	.	1.570	1.771	1.898	1.891	1.882
LANGELIERS INDEX (DMNSLESS)							
		DET'N LIMIT = N/A		GUIDELINE = N/A			
1991 MAY	.	.818	.	.797	.	.781	.853
1991 JUN	.539	.	.494	.	.	.615	.650
1991 JUL	.	.773	.	.774	.	.756	.838
1991 AUG	.	.820	.	.781	.	.855	.808
1991 SEP	.	.997	.	.947	.	.929	.985
1991 OCT	.	.790	.688	.	.	.786	.837
1991 NOV	.	.847	.	.784	.	.864	.832
1992 JAN	.	.	.843	.	.954	.941	.908
1992 FEB	.781	.	.	.	.	.878	.883
1992 MAY	.822	.834	.	.	.	.959	.874
1992 AUG	.	.820	.	.889	.931	.887	.908
1992 DEC	.	.	.738	.811	.843	.856	.848

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

CHEMISTRY (LABORATORY)		DET'N LIMIT = N/A	GUIDELINE = N/A
IRONAL (OMNSLESS)			
1991 JUL	4.441	.	.
1991 AUG	.853 NAF	.	.
1991 SEP	.958	.	.
1991 OCT	.355	.	.
1992 JAN	.000 NAF	.	.
POTASSIUM (MG/L)			
		DET'N LIMIT = 0.01	GUIDELINE = 10 (F2)
1991 JUL	1.760	.	.
1991 AUG	2.250	.	.
1991 SEP	2.200	.	.
1991 OCT	2.320	.	.
LANGELIERS INDEX (OMNSLESS)			
		DET'N LIMIT = N/A	GUIDELINE = N/A
1991 JUL	.812	.	.
1991 AUG	.806	.	.
1991 SEP	.959	.	.
1991 OCT	.794	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHEMISTRY (LABORATORY)							
MAGNESIUM (MG/L)		DET'N LIMIT = 0.1		GUIDELINE = 30.0 (F2)			
1991 MAY	.	12.500	.	11.300	.	11.100	12.900
1991 JUN	10.150	.	8.700	.	.	10.550	12.000
1991 JUL	.	10.300	.	11.000	.	10.700	10.900
1991 AUG	.	12.200	.	11.400	.	11.400	12.200
1991 SEP	.	11.400	.	11.300	.	11.000	11.500
1991 OCT	.	12.700	9.950	.	.	11.300	12.700
1991 NOV	.	11.850	.	10.950	.	11.750	12.100
1992 JAN	.	.	11.900	.	12.750	8.700	12.300
1992 FEB	11S	.	.	.	.	12.300	12.700
1992 MAY	10.800	9.650	.	.	11.920	10.500	12.780
1992 AUG	.	11.280	.	11.880	13.140	12.780	12.780
1992 DEC	.	.	9.840	12.200	12.100	11.900	12.000
SODIUM (MG/L)							
		DET'N LIMIT = 0.20		GUIDELINE = 200 (A4)			
1991 MAY	.	10.800	.	5.200	.	7.000	10.400
1991 JUN	9.200	.	10.000	.	.	7.300	11.100
1991 JUL	.	2.700	.	5.000	.	6.400	5.100
1991 AUG	.	8.600	.	5.400	.	7.200	8.400
1991 SEP	.	8.000	.	4.000	.	8.400	8.000
1991 OCT	.	12.300	7.800	.	.	8.300	12.400
1991 NOV	.	6.800	.	5.200	.	8.300	6.900
1992 JAN	.	.	9.800	.	10.200	12.800	9.900
1992 FEB	5.060	11S	.	.	.	8.820	8.890
1992 MAY	10.300	4.630	.	3.300	14.580	9.570	10.600
1992 AUG	.	5.280	.	5.510	15.610	12.720	14.040
1992 DEC	.	.	13.250	.	.	12.560	15.040
AMMONIUM TOTAL (MG/L)							
		DET'N LIMIT = 0.002		GUIDELINE = 0.05 (F2)			
1991 MAY	.	BOL	.	BOL	.	BOL	BOL
1991 JUN	BOL	.	BOL	.	.	BOL	.002 <T
1991 JUL	.	.002 <T	.	BOL	.	BOL	BOL
1991 AUG	.	BOL	.	BOL	.	BOL	BOL
1991 SEP	.	BOL	.	BOL	.	BOL	BOL
1991 OCT	.	.002 <T	.002 <T	.	.	BOL	.002 <T
1991 NOV	.	BOL	.	BOL	.	BOL	BOL
1992 JAN	.	.	BOL	.	BOL	BOL	BOL
1992 FEB	BOL	.	.	.	.	.002 <T	.002 <T
1992 MAY	.002 <T	.002 <T	.	.	.	.002 <T	.002 <T
1992 AUG	.	BOL	.	BOL	BOL	BOL	BOL
1992 DEC	.	.	.010	.012	.008 <T	.006 <T	.004 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM HOWE ST STANDING		CHEMISTRY (LABORATORY)		
MAGNESIUM (MG/L)		DET'N LIMIT = 0.1	GUIDELINE = 30.0 (F2)	
1991 JUL	10.950	.	.	.
1991 AUG	11.600	.	.	.
1991 SEP	11.300	.	.	.
1991 OCT	12.300	.	.	.
SODIUM (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 200 (A4)	
1991 JUL	5.100	.	.	.
1991 AUG	8.200	.	.	.
1991 SEP	8.000	.	.	.
1991 OCT	12.600	.	.	.
AMMONIUM TOTAL (MG/L)		DET'N LIMIT = 0.002	GUIDELINE = 0.05 (F2)	
1991 JUL	BDL	.	.	.
1991 AUG	BDL	.	.	.
1991 SEP	BDL	.	.	.
1991 OCT	.002 <T	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHEMISTRY (LABORATORY)							
NITRITE (MG/L)							
DET'N LIMIT = 0.001							
GUIDELINE = 1.0 (A1)							
1991 MAY	.	.001 <T	.	.001 <T	.	.001 <T	.001 <T
1991 JUN	BDL	.	BDL	.	.	BDL	BDL
1991 JUL	.	.002 <T	.	.001 <T	.	BDL	.001 <T
1991 AUG	.	.002 <T	.	.001 <T	.	.001 <T	.001 <T
1991 SEP	.	BDL	.	BDL	.	BDL	BDL
1991 OCT	.	BDL	.	.	.	BDL	BDL
1991 NOV	.	.001 <T	.	.001 <T	.	.001 <T	.001 <T
1992 JAN	.	.	.002 <T	.	.002 <T	.001 <T	.001 <T
1992 FEB	.001 <T	.005	.	.	.	.001 <T	.001 <T
1992 MAR	.	.002 <T	.	.	.	.001 <T	.001 <T
1992 APR	.	.004 <T	.	.005	.005	.006	.006
1992 MAY	.	.	.001 <T	.002 <T	.001 <T	.001 <T	.001 <T
1992 JUN	.	.	.	.	.	.	.
1992 JUL	.	.	.	.	.	.	.
1992 AUG	.	.	.	.	.	.	.
1992 SEP	.	.	.	.	.	.	.
1992 OCT	.	.	.	.	.	.	.
1992 NOV	.	.	.	.	.	.	.
1992 DEC	.	.	.	.	.	.	.
NITRATE (TOTAL) (MG/L)							
DET'N LIMIT = 0.005							
GUIDELINE = 10.0 (A1)							
1991 MAY	.	1.310	.	1.140	.	1.010	1.320
1991 JUN	.780	.	.785	.	.	1.030	1.260
1991 JUL	.	.510	.	1.190	.	1.090	1.190
1991 AUG	.	1.150	.	1.290	.	1.250	1.160
1991 SEP	.	1.070	.	1.200	.	1.170	1.060
1991 OCT	.	1.280	.740	.	.	1.220	1.250
1991 NOV	.	1.400	.	.825	.	1.250	1.420
1992 JAN	.	.	1.120	.	1.650	1.430	1.080
1992 FEB	.385	.	.	.	.	1.470	1.580
1992 MAR	.685	.310	.	.	.	1.300	.710
1992 APR	.	.755	.	1.350	1.660	1.580	1.640
1992 MAY	.	.	.875	1.670	1.770	1.450	1.700
1992 JUN	.	.	.	.	.	.	.
1992 JUL	.	.	.	.	.	.	.
1992 AUG	.	.	.	.	.	.	.
1992 SEP	.	.	.	.	.	.	.
1992 OCT	.	.	.	.	.	.	.
1992 NOV	.	.	.	.	.	.	.
1992 DEC	.	.	.	.	.	.	.
NITROGEN TOT KJELD (MG/L)							
DET'N LIMIT = 0.02							
GUIDELINE = N/A							
1991 MAY	.	.110	.	.100	.	.080 <T	.100
1991 JUN	.020 <T	.	.040 <T	.	.	.060 <T	.060 <T
1991 JUL	.	.050 <T	.	.030 <T	.	.080 <T	.070 <T
1991 AUG	.	BDL	.	.030 <T	.	BDL	.040 <T
1991 SEP	.	.040 <T	.	.070 <T	.	.060 <T	.090 <T
1991 OCT	.	.100	.070 <T	.	.	.100	.090 <T
1991 NOV	.	.080 <T	.	.050 <T	.	.050 <T	.080 <T
1992 JAN	.	.	.050 <T	.	.090 <T	.090 <T	.070 <T
1992 FEB	.040 <T	.115	.	.	.	.050 <T	.040 <T
1992 MAR	.	.050 <T	.	.080 <T	.100	.060 <T	.050 <T
1992 APR	.	.060 <T	.	.110	.110	.090 <T	.100
1992 MAY	.	.	.080 <T	.	.	.080 <T	.090 <T
1992 JUN	.	.	.	.	.	.	.
1992 JUL	.	.	.	.	.	.	.
1992 AUG	.	.	.	.	.	.	.
1992 SEP	.	.	.	.	.	.	.
1992 OCT	.	.	.	.	.	.	.
1992 NOV	.	.	.	.	.	.	.
1992 DEC	.	.	.	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

CHEMISTRY (LABORATORY)		DET'N LIMIT = 0.001	GUIDELINE = 1.0 (A1)
NITRITE (MG/L)			
1991 JUL	BDL	.	.
1991 AUG	.002 <T	.	.
1991 SEP	BDL	.	.
1991 OCT	BDL	.	.
NITRATE (TOTAL) (MG/L)		DET'N LIMIT = 0.005	GUIDELINE = 10.0 (A1)
1991 JUL	1.190	.	.
1991 AUG	1.150	.	.
1991 SEP	1.050	.	.
1991 OCT	1.270	.	.
NITROGEN TOT KJELD (MG/L)		DET'N LIMIT = 0.02	GUIDELINE = N/A
1991 JUL	.060 <T	.	.
1991 AUG	.020 <T	.	.
1991 SEP	.100	.	.
1991 OCT	.110	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHEMISTRY (LABORATORY)							
PH (DMNSLESS)		DET'N LIMIT = N/A		GUIDELINE = 6.5-8.5 (A4)			
1991 MAY	.	8.220	.	8.220	.	8.230	8.220
1991 JUN	8.220	.	8.220	.	.	8.270	8.250
1991 JUL	.	8.310	.	8.230	.	8.240	8.290
1991 AUG	.	8.200	.	8.190	.	8.270	8.200
1991 SEP	.	8.420	.	8.360	.	8.370	8.400
1991 OCT	.	8.150	8.200	.	.	8.200	8.190
1991 NOV	.	8.250	8.320	8.250	.	8.280	8.230
1992 JAN	.	.	8.320	.	8.340	8.350	8.360
1992 FEB	8.420	!!S	.	.	.	8.390	8.460
1992 MAR	8.400	8.370	.	.	.	8.370	8.350
1992 AUG	.	8.280	.	8.280	8.280	8.250	8.260
1992 DEC	.	.	8.270	8.250	8.250	8.320	8.220
PHOSPHORUS FIL REACT (MG/L)							
		DET'N LIMIT = 0.0005		GUIDELINE = N/A			
1991 MAY	.	.000 <T	.	BDL	.	BDL	.
1991 JUN	.001 <T	.	.001 <T	.	.	.001 <T	.
1991 JUL	.	BDL	.	BDL	.	BDL	.
1991 AUG	.	.001 <T	.	.000 <T	.	.000 <T	.000 <T
1991 SEP	.	BDL	.	BDL	.	.000 <T	.
1991 OCT	.	.000 <T	.000 <T	.	.	BDL	.
1991 NOV	.	.001 <T	.	.001 <T	.	.	.
1992 JAN	.	.	.002	.	.000 <T	BDL	.
1992 FEB	BDL	.	.	.	.	BDL	.
1992 MAR	BDL	BDL	.	.	.	BDL	.
1992 AUG	.	BDL	.	BDL	.	BDL	.
1992 DEC	.	.	.003 <T	.001 <T	BDL	BDL	.
PHOSPHORUS TOTAL (MG/L)							
		DET'N LIMIT = 0.002		GUIDELINE = 0.40 (F2)			
1991 MAY	.	.002 <T	.003 <T	.005 <T	.	BDL	.
1991 JUN	.	.	.	.	.	.002 <T	.
1991 JUL	.002 <T	.003 <T	.	BDL	.	.002 <T	.
1991 AUG	.	BDL	.	BDL	.	BDL	.011
1991 SEP	.	.002 <T	.002 <T	.002 <T	.	.002 <T	.
1991 OCT	.	BDL	.003 <T	.	.	BDL	.
1991 NOV	.	.002 <T	.003 <T	.003 <T	.	.	.
1992 JAN	.	.	.004 <T	.	.003 <T	.003 <T	.
1992 FEB	!!S	.	.	.	.	.002 <T	.
1992 MAR	BDL	BDL	.	.	.	BDL	.
1992 AUG	.	.004 <T	.	.003 <T	.	.003 <T	.
1992 DEC	.	.	.005 <T	.004 <T	.003 <T	.003 <T	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

PH (DMNSLESS)	CHEMISTRY (LABORATORY)		GUIDELINE = 6.5-8.5 (A4)	
	DET'N LIMIT = N/A			
1991 JUL	8.250	.	.	.
1991 AUG	8.180	.	.	.
1991 SEP	8.360	.	.	.
1991 OCT	8.130	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHEMISTRY (LABORATORY)							
RESIDUE FILTRATE (MG/L)	DET'N LIMIT = N/A		GUIDELINE = 500 (A3)				
1991 MAY	.	291.000 CRO	.	249.000 CRO	.	247.000 CRO	290.000 CRO
1991 JUN	276.000 CRO	.	245.000 CRO	.	.	257.000 CRO	295.000 CRO
1991 JUL	.	222.000 CRO	.	254.000 CRO	.	253.000 CRO	253.000 CRO
1991 AUG	.	274.000 CRO	.	254.000 CRO	.	266.000 CRO	274.000 CRO
1991 SEP	.	258.000 CRO	.	247.000 CRO	.	263.000 CRO	257.000 CRO
1991 OCT	.	315.000 CRO	240.000 CRO	.	.	272.000 CRO	314.000 CRO
1991 NOV	.	265.000 CRO	293.000 CRO	231.000 CRO	.	270.000 CRO	268.000 CRO
1992 JAN	.	.	.	.	321.000 CRO	305.000 CRO	293.000 CRO
1992 FEB	222.000 CRO	.	.	.	.	305.000 CRO	313.000 CRO
1992 MAY	262.000 CRO	224.000 CRO	.	.	.	283.000 CRO	265.000 CRO
1992 AUG	.	251.000 CRO	.	266.000 CRO	334.000 CRO	320.000 CRO	330.000 CRO
1992 DEC	.	.	251.000 CRO	283.000 CRO	322.000 CRO	294.000 CRO	317.000 CRO
SULPHATE (MG/L)							
		DET'N LIMIT = 0.20		GUIDELINE = 500 (A3)			
1991 MAY	.	12.850	.	10.880	.	10.520	12.480
1991 JUN	10.260	.	9.800	.	.	10.550	12.070
1991 JUL	.	12.480	.	11.450	.	11.450	11.780
1991 AUG	.	12.490	.	11.770	.	12.340	14.620
1991 SEP	.	12.580	.	10.760	.	10.730	12.050
1991 OCT	.	13.310	11.380	.	.	12.130	13.470
1991 NOV	.	10.760	.	10.750	.	11.200	10.440
1992 JAN	.	.	11.460	.	13.520	13.050	11.230
1992 FEB	10.880	12.030	.	.	.	12.380	12.520
1992 MAY	10.420	9.980	.	.	.	11.650	10.480
1992 AUG	.	12.640	.	11.580	13.470	13.280	13.480
1992 DEC	.	.	10.850	11.960	14.120	12.360	13.780
TURBIDITY (FTU)							
		DET'N LIMIT = 0.05		GUIDELINE = 1.0 (A1)			
1991 MAY	.	.180 <T	.	.400	.	.090 <T	.090 <T
1991 JUN	.040	.	.060	.	.	.020	.030
1991 JUL	.	.380	.	.090	.	.140	.080
1991 AUG	.	.050	.	.070	.	.040	.080
1991 SEP	.	.090	.	.090	.	.130	.190
1991 OCT	.	.070 <T	.220 <T	.	.	.070 <T	.100 <T
1991 NOV	.	.200 <T	.	.120 <T	.	.140 <T	.120 <T
1992 JAN	.	.	.280	.	.510	.280	.260
1992 FEB	.780	1.520	.	.	.	.320	.150 <T
1992 MAY	.	.190 <T	.	.	.	.220 <T	.190 <T
1992 AUG	.	12.800	.	.120 <T	.300	.160 <T	.250
1992 DEC	.	.140 <T	.850	.700	.440	.180 <T	.170 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

CHEMISTRY (LABORATORY)		DET'N LIMIT = N/A	GUIDELINE = 500 (A3)
RESIDUE FILTRATE (MG/L)			
1991 JUL	255,000 CRO	.	.
1991 AUG	276,000 CRO	.	.
1991 SEP	259,000 CRO	.	.
1991 OCT	318,000 CRO	.	.
SULPHATE (MG/L)		DET'N LIMIT = 0.20	GUIDELINE = 500 (A3)
1991 JUL	11.450	.	.
1991 AUG	12.890	.	.
1991 SEP	10.970	.	.
1991 OCT	13.190	.	.
TURBIDITY (FTU)		DET'N LIMIT = 0.05	GUIDELINE = 1.0 (A1)
1991 JUL	.160	.	.
1991 AUG	.220	.	.
1991 SEP	.250	.	.
1991 OCT	.210 <T	.	.

TABLE 4

DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
METALS							
SILVER (UG/L)	DET'N LIMIT = 0.05			GUIDELINE = N/A			
1991 MAY	.	BDL	BDL	.	BDL	.	BDL
1991 JUN	.	BDL	.	BDL	.	.	BDL
1991 JUL	.	BDL	.	BDL	.	.	BDL
1991 AUG	.	BDL	.	BDL	.	i SM	BDL
1991 SEP	.	BDL	.	BDL	.	.	BDL
1991 OCT	.	BDL	BDL	.	.	BDL	BDL
1991 NOV	.	BDL	.	BDL	.	BDL	BDL
1992 JAN	.	.	BDL	.	BDL	BDL	BDL
1992 FEB	BDL	.	.	.	.	BDL	BDL
1992 MAY	BDL	.060 <T	.	.	.	BDL	BDL
1992 AUG	.	BDL	.	BDL	BDL	BDL	BDL
1992 DEC	.	.	BDL	BDL	BDL	BDL	BDL
ALUMINUM (UG/L)							
	DET'N LIMIT = 0.10			GUIDELINE = 100 (A4)			
1991 MAY	.	1.600	.	1.700	.	1.600	1.600
1991 JUN	2.900	.	2.500	.	.	2.300	2.400
1991 JUL	.	1.400	.	1.100	.	1.400	2.300
1991 AUG	.	5.000	.	4.600	.	i SM	4.700
1991 SEP	.	1.500	.	1.700	.	1.800	1.500
1991 OCT	.	1.700	2.300	.	.	1.700	1.500
1991 NOV	.	1.500	.	1.600	.	2.100	1.500
1992 JAN	.	.	1.500	.	1.200	1.400	1.100
1992 FEB	1.400	.	.	.	.	2.100	.780 <T
1992 MAY	2.900	4.300	.	.	.	2.400	7.900
1992 AUG	.	5.600	.	4.800	4.000	4.100	4.000
1992 DEC	.	.	2.000	2.100	2.000	2.300	1.800
ARSENIC (UG/L)							
	DET'N LIMIT = 0.10			GUIDELINE = 25 (A1)			
1991 MAY	.	BDL	.	BDL	.	BDL	BDL
1991 JUN	.140 <T	.	.280 <T	.	.	.210 <T	.340 <T
1991 JUL	.	.160 <T	.	BDL	.	BDL	BDL
1991 AUG	.	.310 <T	.	.330 <T	.	i SM	.340 <T
1991 SEP	.	.180 <T	.	.280 <T	.	.260 <T	.330 <T
1991 OCT	.	.440 <T	.270 <T	.	.	.390 <T	.480 <T
1991 NOV	.	.200 <T	.280 <T	.260 <T	.	.150 <T	.180 <T
1992 JAN	.	.	.	.	.250 <T	.250 <T	.180 <T
1992 FEB	.220 <T	BDL	.	.	.	.350 <T	.290 <T
1992 MAY	.110 <T	BDL	.	.	.	BDL	BDL
1992 AUG	.	.530 <T	.	.350 <T	.370 <T	.390 <T	.420 <T
1992 DEC	.	.	.260 <T	.400 <T	.180 <T	.260 <T	.420 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

METALS		DET'N LIMIT = 0.05	GUIDELINE = N/A
SILVER (UG/L)			
1991 JUL	BDL	.	.
1991 AUG	BDL	.	.
1991 SEP	BDL	.	.
1991 OCT	BDL	.	.

ALUMINUM (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 100 (A4)
1991 JUL	1.200	.	.
1991 AUG	5.400	.	.
1991 SEP	1.700	.	.
1991 OCT	1.800	.	.

ARSENIC (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 25 (A1)
1991 JUL	BDL	.	.
1991 AUG	.260 <T	.	.
1991 SEP	.370 <T	.	.
1991 OCT	.390 <T	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
METALS							
BARIUM (UG/L)							
		DET'N LIMIT = 0.05		GUIDELINE = 1000 (A2)			
1991 MAY	.	23.000	.	19.000	.	19.000	23.000
1991 JUN	17.000	.	18.000	.	.	19.000	24.000
1991 JUL	.	21.000	.	21.000	.	20.000	20.000
1991 AUG	.	24.000	.	21.000	.	ISM	23.000
1991 SEP	.	23.000	.	19.000	.	18.000	20.000
1991 OCT	.	26.000	.	.	.	21.000	25.000
1991 NOV	.	23.000	.	21.000	.	20.000	22.000
1992 JAN	.	.	23.000	.	22.000	21.000	21.000
1992 FEB	16.000	15.000	.	.	.	23.000	25.000
1992 MAY	18.000	.	.	.	.	20.000	20.000
1992 AUG	.	23.000	.	22.000	24.000	23.000	24.000
1992 DEC	.	.	20.000	23.000	24.000	22.000	23.000
BORON (UG/L)							
		DET'N LIMIT = 2.00		GUIDELINE = 5000 (A1)			
1991 MAY	.	6.200 <T	.	6.800 <T	.	11.000 <T	10.000 <T
1991 JUN	8.100 <T	.	6.100 <T	.	.	5.300 <T	13.000 <T
1991 JUL	.	16.000 <T	.	18.000 <T	.	15.000 <T	17.000 <T
1991 AUG	.	29.000	.	24.000	.	ISM	21.000
1991 SEP	.	7.300 <T	.	7.500 <T	.	7.900 <T	8.400 <T
1991 OCT	.	16.000 <T	.	.	.	19.000 <T	17.000 <T
1991 NOV	.	8.100 <T	.	6.600 <T	.	7.900 <T	8.300 <T
1992 JAN	.	.	12.000 <T	.	16.000 <T	9.700 <T	8.100 <T
1992 FEB	9.400 <T	8.000 <T	.	.	.	7.600 <T	8.000 <T
1992 MAY	13.000 <T	12.000 <T	.	.	.	12.000 <T	8.900 <T
1992 AUG	.	41.000	.	44.000	41.000	33.000	42.000
1992 DEC	.	.	9.900 <T	10.000 <T	9.300 <T	11.000 <T	12.000 <T
BERYLLIUM (UG/L)							
		DET'N LIMIT = 0.05		GUIDELINE = 6800 (D4)			
1991 MAY	.	BDL	.	BDL	.	BDL	BDL
1991 JUN	BDL	.	BDL	.	.	BDL	BDL
1991 JUL	.	BDL	.	BDL	.	BDL	BDL
1991 AUG	.	BDL	.	BDL	.	ISM	.080 <T
1991 SEP	.	BDL	.	BDL	.	BDL	.070 <T
1991 OCT	.	BDL	BDL	.	.	.060 <T	.070 <T
1991 NOV	.	BDL	BDL	BDL	.	BDL	BDL
1992 JAN	.	.	BDL	.	BDL	BDL	BDL
1992 FEB	BDL	.	.	.	.	BDL	BDL
1992 MAY	.060 <T	BDL	.	.	.	.080 <T	.110 <T
1992 AUG	.	.100 <T	.	.100 <T	.060 <T	.060 <T	.120 <T
1992 DEC	.	.	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

METALS		DET'N LIMIT = 0.05	GUIDELINE = 1000 (A2)	
BARIUM (UG/L)				
1991 JUL	27.000	.	.	.
1991 AUG	30.000	.	.	.
1991 SEP	26.000	.	.	.
1991 OCT	30.000	.	.	.
BORON (UG/L)				
		DET'N LIMIT = 2.00	GUIDELINE = 5000 (A1)	
1991 JUL	19.000 <T	.	.	.
1991 AUG	12.000 <T	.	.	.
1991 SEP	11.000 <T	.	.	.
1991 OCT	20.000 <T	.	.	.
BERYLLIUM (UG/L)				
		DET'N LIMIT = 0.05	GUIDELINE = 6800 (D4)	
1991 JUL	BDL	.	.	.
1991 AUG	BDL	.	.	.
1991 SEP	.070 <T	.	.	.
1991 OCT	.060 <T	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
METALS							
CADMIUM (UG/L)							
		DET'N LIMIT = 0.05		GUIDELINE = 5.0 (A1)			
1991 MAY	.	BDL	.	BDL	.	BDL	BDL
1991 JUN	BDL	.	BDL	.	.	BDL	BDL
1991 JUL	.	BDL	.	BDL	.	BDL	BDL
1991 AUG	.	BDL	.	BDL	.	ISM	BDL
1991 SEP	.	BDL	.	BDL	.	BDL	BDL
1991 OCT	.	BDL	BDL	.	.	BDL	BDL
1991 NOV	.	BDL	.	BDL	.	BDL	BDL
1992 JAN	.	BDL	BDL	.	BDL	BDL	BDL
1992 FEB	BDL	.	.	.	.	BDL	BDL
1992 MAY	.390 <T	BDL	.	.	.	BDL	.070 <T
1992 AUG	.	BDL	.	BDL	BDL	BDL	BDL
1992 DEC	.	.	BDL	BDL	BDL	BDL	BDL
COBALT (UG/L)							
		DET'N LIMIT = 0.02		GUIDELINE = N/A			
1991 MAY	.	BDL	.	BDL	.	BDL	BDL
1991 JUN	.030 <T	.	BDL	.	.	.040 <T	.030 <T
1991 JUL	.	.070 <T	.	.070 <T	.	.070 <T	.080 <T
1991 AUG	.	.100 <T	.	.130 <T	.	ISM	.120 <T
1991 SEP	.	.070 <T	.	BDL	.	.060 <T	BDL
1991 OCT	.	.110 <T	.170 <T	.	.	.080 <T	.110 <T
1991 NOV	.	.190 <T	.	.140 <T	.	.160 <T	.130 <T
1992 JAN	.	.	.090 <T	.	.060 <T	.130 <T	.080 <T
1992 FEB	.200 <T	.120 <T	.	.	.	.280 <T	.300 <T
1992 MAY	.140 <T	.210 <T	.	.	.190 <T	.050 <T	.060 <T
1992 AUG	.	.	.150 <T	.220 <T	.190 <T	.190 <T	.180 <T
1992 DEC	.	.	.	.140 <T	.210 <T	.160 <T	.270 <T
CHROMIUM (UG/L)							
		DET'N LIMIT = 0.50		GUIDELINE = 50.0 (A1)			
1991 MAY	.	.710 <T	.	1.700 <T	.	4.100 <T	4.200 <T
1991 JUN	.910 <T	.	.510 <T	.	.	.540 <T	4.400 <T
1991 JUL	.	4.800 <T	.	5.800	.	4.700 <T	5.300
1991 AUG	.	3.100 <T	.	2.600 <T	.	ISM	2.400 <T
1991 SEP	.	.740 <T	.	.900 <T	.	1.000 <T	1.400 <T
1991 OCT	.	4.000 <T	1.000 <T	.	.	5.200	4.400 <T
1991 NOV	.	.800 <T	.	.670 <T	.	.570 <T	.730 <T
1992 JAN	.	.	2.900 <T	.	3.500 <T	.900 <T	.800 <T
1992 FEB	BDL	.	.	.	.	.750 <T	.800 <T
1992 MAY	2.200 <T	2.300 <T	.	.	.	2.700 <T	.780 <T
1992 AUG	.	5.400	.	5.300	4.600 <T	3.600 <T	4.500 <T
1992 DEC	.	.	2.100 <T	2.200 <T	.810 <T	2.300 <T	2.200 <T

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

METALS		DET'N LIMIT = 0.05	GUIDELINE = 5.0 (A1)
CADMIUM (UG/L)			
1991 JUL	.060 <T	.	.
1991 AUG	BDL	.	.
1991 SEP	BDL	.	.
1991 OCT	.190 <T	.	.
COBALT (UG/L)		DET'N LIMIT = 0.02	GUIDELINE = N/A
1991 JUL	.090 <T	.	.
1991 AUG	.120 <T	.	.
1991 SEP	.060 <T	.	.
1991 OCT	.110 <T	.	.
CHROMIUM (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 50.0 (A1)
1991 JUL	5.800	.	.
1991 AUG	1.000 <T	.	.
1991 SEP	1.900 <T	.	.
1991 OCT	5.000 <T	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
METALS							
COPPER (UG/L)							
		DET'N LIMIT = 0.50		GUIDELINE = 1000 (A3)			
1991 MAY	.	.	BOL	.	BOL	12.000	3.900 <T
1991 JUN	.610 <T	.	BOL	.	.	33.000	3.200 <T
1991 JUL	.	1.300 <T	.	.530 <T	.	62.000	5.300
1991 AUG	.	.750 <T	.	BOL	.	ISM	5.700
1991 SEP	.	BOL	BOL	.640 <T	.	11.000	8.000
1991 OCT	.	BOL	BOL	.	.	75.000	12.000
1991 NOV	.	.690 <T	BOL	BOL	.	59.000	4.600 <T
1992 JAN	.	.	BOL	.	.850 <T	17.000	5.600
1992 FEB	7.400	2.600 <T	.	.	.	10.000	12.000
1992 MAR	.	1.600 <T	.	.	.	8.700	5.800
1992 APR	.	1.500 <T	.	.810 <T	1.100 <T	3.400 <T	5.100
1992 DEC	.	.	.700 <T	.880 <T	1.100 <T	47.000	13.000
IRON (UG/L)							
		DET'N LIMIT = 6.00		GUIDELINE = 300 (A3)			
1991 MAY	.	16.000 <T	.	BOL	.	BOL	BOL
1991 JUN	BOL	.	BOL	.	.	BOL	BOL
1991 JUL	.	19.000 <T	.	BOL	.	BOL	BOL
1991 AUG	.	BOL	.	BOL	.	ISM	BOL
1991 SEP	.	BOL	.	BOL	.	BOL	BOL
1991 OCT	.	BOL	BOL	.	.	BOL	BOL
1991 NOV	.	BOL	BOL	BOL	.	BOL	BOL
1992 JAN	.	.	BOL	.	8DL	7.300 <T	BOL
1992 FEB	110.000	460.000	.	.	.	BOL	BOL
1992 MAR	.	38.000 <T	.	.	.	14.000 <T	21.000 <T
1992 APR	.	11.000 <T	.	BOL	BOL	BOL	BOL
1992 DEC	.	.	BOL	BOL	BOL	8.600 <T	BOL
MERCURY (UG/L)							
		DET'N LIMIT = 0.02		GUIDELINE = 1.0 (A1)			
36 SAMPLES	BOL	BOL	BOL	BOL	BOL	BOL	ISS
MANGANESE (UG/L)							
		DET'N LIMIT = 0.05		GUIDELINE = 50.0 (A3)			
1991 MAY	.	.580	.330 <T	.100 <T	.	.130 <T	.650
1991 JUN	.	.060 <T	.	.	.	.200 <T	.700
1991 JUL	.	1.700	.	BOL	.	.180 <T	.630
1991 AUG	.	.510	.	BOL	.	ISM	.630
1991 SEP	.	.570	.	.100 <T	.	.130 <T	.780
1991 OCT	.	.600	.330 <T	.	.	.210 <T	.750
1991 NOV	.	BOL	.260 <T	.810	.	.210 <T	.250 <T
1992 JAN	.	.	.	.	.060 <T	.170 <T	.280 <T
1992 FEB	1.100	3.200	.	.	.	.170 <T	.200 <T
1992 MAR	.	.300 <T	.	.	.	.660	1.100
1992 APR	.	.990	.	.280 <T	.200 <T	.260 <T	.760
1992 DEC	.	.	.170 <T	.080 <T	.090 <T	.260 <T	.840

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

METALS		DET'N LIMIT = 0.50	GUIDELINE = 1000 (A3)	
COPPER (UG/L)				
1991 JUL	14.000	.	.	.
1991 AUG	15.000	.	.	.
1991 SEP	12.000	.	.	.
1991 OCT	150.000	.	.	.

IRON (UG/L)		DET'N LIMIT = 6.00	GUIDELINE = 300 (A3)	
1991 JUL	20.000 <T	.	.	.
1991 AUG	15.000 <T	.	.	.
1991 SEP	BDL	.	.	.
1991 OCT	9.200 <T	.	.	.

MANGANESE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 50.0 (A3)	
1991 JUL	1.800	.	.	.
1991 AUG	1.700	.	.	.
1991 SEP	1.600	.	.	.
1991 OCT	1.200	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
METALS							
MOLYBDENUM (UG/L)							
		DET'N LIMIT = 0.05		GUIDELINE = N/A			
1991 MAY			.460 <T	.370 <T		.360 <T	.430 <T
1991 JUN	.310 <T		.410 <T			.450 <T	.540
1991 JUL			.700	.400 <T		.370 <T	.370 <T
1991 AUG			.580	.340 <T		ISM	.470 <T
1991 SEP			.680	.430 <T		.460 <T	.690
1991 OCT			.560			.420 <T	.520
1991 NOV			.360 <T	.680		.410 <T	.370 <T
1992 JAN	.320 <T				.450 <T	.450 <T	.450 <T
1992 FEB		.060 <T	.420 <T			.380 <T	.340 <T
1992 MAY	BDL					BDL	BDL
1992 AUG		.560		.290 <T	.360 <T	.510	.310 <T
1992 DEC			.380 <T	.320 <T	.440 <T	.370 <T	.400 <T
NICKEL (UG/L)							
		DET'N LIMIT = 0.20		GUIDELINE = 350 (03)			
1991 MAY				BDL		BDL	BDL
1991 JUN	BDL		BDL			BDL	BDL
1991 JUL				BDL		BDL	BDL
1991 AUG			1.100 <T	.950 <T		ISM	1.100 <T
1991 SEP			BDL	BDL		BDL	BDL
1991 OCT			.340 <T			.280 <T	.290 <T
1991 NOV			BDL	BDL		BDL	BDL
1992 JAN					BDL		BDL
1992 FEB	1.500 <T	.920 <T				1.400 <T	1.700 <T
1992 MAY	BDL			.370 <T	.460 <T	BDL	BDL
1992 AUG		.260 <T		BDL	.320 <T	.460 <T	.520 <T
1992 DEC			.370 <T	BDL		BDL	BDL
LEAD (UG/L)							
		DET'N LIMIT = 0.05		GUIDELINE = 10 (A1)			
1991 MAY				BDL		.100 <T	.620
1991 JUN	BDL		BDL			.100 <T	.530
1991 JUL				.330 <T		.190 <T	7.900
1991 AUG		.160 <T		BDL		ISM	.570
1991 SEP		.090 <T		BDL		.060 <T	.430 <T
1991 OCT		BDL				.120 <T	.620
1991 NOV		BDL		BDL		.140 <T	.380 <T
1992 JAN					BDL	.060 <T	.720
1992 FEB	1.300	.600				.110 <T	.550
1992 MAY	.540					.120 <T	.470 <T
1992 AUG		2.400		.120 <T		BDL	.540
1992 DEC		.260 <T	.080 <T	.090 <T	.090 <T	.120 <T	2.100

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

METALS		DET'N LIMIT = 0.05		GUIDELINE = N/A	
MOLYBDENUM (UG/L)					
1991 JUL	.420 <T	.	.	.	.
1991 AUG	.490 <T	.	.	.	.
1991 SEP	.690	.	.	.	.
1991 OCT	.550	.	.	.	.

NICKEL (UG/L)		DET'N LIMIT = 0.20		GUIDELINE = 350 (03)	
1991 JUL	BOL	.	.	.	.
1991 AUG	2.100	.	.	.	.
1991 SEP	BOL	.	.	.	.
1991 OCT	1.100 <T	.	.	.	.

LEAD (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 10 (A1)	
1991 JUL	11.000	.	.	.	.
1991 AUG	1.700	.	.	.	.
1991 SEP	.590	.	.	.	.
1991 OCT	6.800	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
METALS							
ANTIMONY (UG/L)							
DET'N LIMIT = 0.05				GUIDELINE = 146 (D4)			
1991 MAY	.	.530	.	.410 <T	.	.420 <T	.490 <T
1991 JUN	.450 <T	.	.510	.	.	.550	.480 <T
1991 JUL	.	.550	.510	.570	.	.530	.630
1991 AUG	.	.300 <T	.	.320 <T	.	ISM	.350 <T
1991 SEP	.	.480 <T	.	.360 <T	.	.370 <T	.430 <T
1991 OCT	.	.560	.640	.560	.	.530	.580
1991 NOV	.	.790	.	.	.	.530	.560
1992 JAN	.	.	.710	.	.540	.700	.690
1992 FEB	.610	.460 <T	.	.	.	.660	.650
1992 MAY	.720	.380 <T	.	.	.410 <T	.450 <T	.460 <T
1992 AUG	.	.340 <T	.	.380 <T	.410 <T	.410 <T	.380 <T
1992 DEC	.	.	.460 <T	.460 <T	.420 <T	.590	.430 <T
SELENIUM (UG/L)							
DET'N LIMIT = 1.00				GUIDELINE = 10 (A1)			
53 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
STRONTIUM (UG/L)							
DET'N LIMIT = 0.10				GUIDELINE = N/A			
1991 MAY	.	61.000	.	53.000	.	51.000	57.000
1991 JUN	60.000	.	48.000	.	.	51.000	60.000
1991 JUL	.	51.000	.	53.000	.	53.000	53.000
1991 AUG	.	57.000	.	53.000	.	ISM	56.000
1991 SEP	.	55.000	.	51.000	.	52.000	53.000
1991 OCT	.	63.000	48.000	.	.	53.000	60.000
1991 NOV	.	61.000	.	54.000	.	63.000	61.000
1992 JAN	.	.	59.000	.	73.000	67.000	59.000
1992 FEB	47.000	54.000	.	.	.	62.000	62.000
1992 MAY	.	83.000	.	.	.	61.000	62.000
1992 AUG	.	58.000	.	59.000	73.000	69.000	71.000
1992 DEC	.	.	52.000	63.000	75.000	64.000	73.000
TITANIUM (UG/L)							
DET'N LIMIT = 0.50				GUIDELINE = N/A			
1991 MAY	.	8.300	7.900	7.900	.	7.300	8.100
1991 JUN	.	8.700	.	.	.	8.000	9.300
1991 JUL	.	.	.990 <T	.930 <T	.	.910 <T	1.100 <T
1991 AUG	.	3.000 <T	.	3.000 <T	.	ISM	3.000 <T
1991 SEP	.	5.400	.	5.600	.	5.100	6.000
1991 OCT	.	5.800	5.500	.	.	5.500	6.100
1991 NOV	.	6.800	5.300	7.300	.	7.300	7.200
1992 JAN	.	.	5.300	.	5.900	6.000	5.800
1992 FEB	5.900	5.700	.	.	.	6.300	6.400
1992 MAY	.	2.200 <T	2.300 <T	.	.	2.100 <T	2.400 <T
1992 AUG	.	13.000	13.000	13.000	13.000	13.000	13.000
1992 DEC	.	.	10.000	11.000	11.000	11.000	11.000

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

DIST. SYSTEM
HOWE ST
STANDING

METALS			
ANTIMONY (UG/L)	DET'N LIMIT = 0.05	GUIDELINE = 146 (D4)	
1991 JUL	.560	.	.
1991 AUG	.310 <T	.	.
1991 SEP	.450 <T	.	.
1991 OCT	.610	.	.
SELENIUM (UG/L)	DET'N LIMIT = 1.00	GUIDELINE = 10 (A1)	
BDL	.	.	.
STRONTIUM (UG/L)	DET'N LIMIT = 0.10	GUIDELINE = N/A	
1991 JUL	60.000	.	.
1991 AUG	63.000	.	.
1991 SEP	59.000	.	.
1991 OCT	63.000	.	.
TITANIUM (UG/L)	DET'N LIMIT = 0.50	GUIDELINE = N/A	
1991 JUL	.990 <T	.	.
1991 AUG	3.200 <T	.	.
1991 SEP	6.100	.	.
1991 OCT	6.500	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
METALS							
THALLIUM (UG/L)	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DET'N LIMIT = 0.05 GUIDELINE = 13 (D4)							
53 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
URANIUM (UG/L)							
DET'N LIMIT = 0.05 GUIDELINE = 100 (A1)							
1991 MAY	.	.490 <T	.	.500 <T	.	.430 <T	.520
1991 JUN	.420 <T	.	.340 <T	.	.	.410 <T	.510
1991 JUL	.	.560	.	.490 <T	.	.410 <T	.480 <T
1991 AUG	.	.520	.	.470 <T	.	ISM	.530
1991 SEP	.	.470 <T	.	.390 <T	.	.310 <T	.340 <T
1991 OCT	.	.590	.400 <T	.	.	.420 <T	.660
1991 NOV	.	.470 <T	.	.490 <T	.	.450 <T	.500 <T
1992 JAN	.	.	.380 <T	.	.710	.590	.370 <T
1992 FEB	.580	.290 <T	.	.	.	.430 <T	.430 <T
1992 MAY	.	.400 <T	.	.	.	.410 <T	.400 <T
1992 AUG	.	.460 <T	.	.350 <T	.600	.610	.600
1992 DEC	.	.	.340 <T	.330 <T	.480 <T	.440 <T	.460 <T
VANADIUM (UG/L)							
DET'N LIMIT = 0.05 GUIDELINE = N/A							
1991 MAY	.	.360 <T	.	.460 <T	.	.460 <T	.340 <T
1991 JUN	.430 <T	.	.430 <T	.	.	.470 <T	.430 <T
1991 JUL	.	.280 <T	.	BDL	.	BDL	BDL
1991 AUG	.	.670	.	.660	.	ISM	.600
1991 SEP	.	.470 <T	.	.500 <T	.	.570	.490 <T
1991 OCT	.	.690	.600	.	.	.520	.600
1991 NOV	.	.430 <T	.	.390 <T	.	.310 <T	.390 <T
1992 JAN	.	.	.490 <T	.	.450 <T	.430 <T	.500 <T
1992 FEB	.440 <T	.430 <T	.	.	.	.570	.550
1992 MAY	.	.240 <T	.	.	.	.080 <T	.080 <T
1992 AUG	.	.620	.	.670	.500 <T	.490 <T	.600
1992 DEC	.	.	.540	.580	.400 <T	.520	.480 <T
ZINC (UG/L)							
DET'N LIMIT = 0.20 GUIDELINE = 5000 (A3)							
1991 MAY	.	1.200 <T	.	.530 <T	.	3.600	31.000
1991 JUN	.	.	1.600 <T	.	.	5.800	35.000
1991 JUL	1.800 <T	.	.	1.300 <T	.	7.500	44.000
1991 AUG	.	2.800	.	.840 <T	.	ISM	37.000
1991 SEP	.	1.900 <T	.	.490 <T	.	3.500	45.000
1991 OCT	.	.480 <T	.	.	.	4.000	33.000
1991 NOV	.	BDL	BDL	.	.	5.300	34.000
1991 DEC	.	1.700 <T	.410 <T	2.600	4.900	3.000	5.900
1992 JAN	.	.	.	.	.	3.500	25.000
1992 FEB	2.200	10.000	.	.	.	14.000	39.000
1992 MAY	.	2.800	.	.	7.000	2.200	47.000
1992 AUG	.	4.900	.	2.400	7.500	7.300	35.000
1992 DEC	.	.	1.900 <T	2.000 <T	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

OIST. SYSTEM
HOWE ST
STANDING

METALS		DET'N LIMIT = 0.05		GUIDELINE = 13 (D4)	
THALLIUM (UG/L)					
BOL					
URANIUM (UG/L)		DET'N LIMIT = 0.05		GUIDELINE = 100 (A1)	
1991 JUL	.510	.	.	.	.
1991 AUG	.530	.	.	.	.
1991 SEP	.440 <T	.	.	.	.
1991 OCT	.560	.	.	.	.
VANADIUM (UG/L)					
		DET'N LIMIT = 0.05		GUIDELINE = N/A	
1991 JUL	.080 <T	.	.	.	.
1991 AUG	.790	.	.	.	.
1991 SEP	.670	.	.	.	.
1991 OCT	.790	.	.	.	.
ZINC (UG/L)					
		DET'N LIMIT = 0.20		GUIDELINE = 5000 (A3)	
1991 JUL	160.000	.	.	.	.
1991 AUG	110.000	.	.	.	.
1991 SEP	74.000	.	.	.	.
1991 OCT	87.000	.	.	.	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHLOROAROMATICS							
HEXACHLOROBUTADIENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 450 (D4)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
123-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1234-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1235-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
124-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 10000 (I)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1245-TETCHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 38000 (D4)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
135-TRICHLOROBENZENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
HEXACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 10 (C1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
HEXACHLOROETHANE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 1900 (D4)			
1991 MAY	.	BDL	.	BDL	.	BDL	1.000 <T
1991 JUN	.	BDL	.	BDL	.	BDL	BDL
1991 JUL	.	IAW	.	IAW	.	IAW	IAW
1991 AUG	.	IAW	.	IAW	.	IAW	IAW
1991 SEP	.	IAW	.	IAW	.	IAW	IAW
1991 OCT	.	ILA	.	BDL	.	BDL	BDL
1991 NOV	.	BDL	.	BDL	.	BDL	BDL
1992 JAN	.	.	.	BDL	.	BDL	BDL
1992 FEB	BDL	.	.	.	.	BDL	BDL
1992 MAY	BDL	BDL	.	.	.	BDL	BDL
1992 AUG	.	BDL	.	.	.	BDL	BDL
1992 DEC	.	.	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOME ST FREE FLOW
CHLOROAROMATICS							
OCTACHLOROSTYRENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PENTACHLOROBENZENE (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 74000 (D4)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
236-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
245-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
26A-TRICHLOROTOLUENE (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
CHLOROPHENOLS							
234-TRICHLOROPHENOL (NG/L)							
		DET'N LIMIT = 100.0	GUIDELINE = N/A				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
2345-TETCHLOROPHENOL (NG/L)							
		DET'N LIMIT = 20.0	GUIDELINE = N/A				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
2356-TETCHLOROPHENOL (NG/L)							
		DET'N LIMIT = 10.0	GUIDELINE = N/A				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
245-TRICHLOROPHENOL (NG/L)							
		DET'N LIMIT = 100.0	GUIDELINE = 2600000 (04)				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
246-TRICHLOROPHENOL (NG/L)							
		DET'N LIMIT = 20.0	GUIDELINE = 5000 (A1)				
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
PENTACHLOROPHENOL (NG/L)							
		DET'N LIMIT = 10.00	GUIDELINE = 60000 (A1)				
1991 MAY	.	BDL	.	BDL	.	BDL	BDL
1991 JUN	BDL	.	BDL	.	.	BDL	BDL
1991 JUL	.	!UN	.	!UN	.	!UN	!UN
1991 AUG	.	!UN	.	!UN	.	!UN	!UN
1991 SEP	.	!UN	.	!UN	.	!UN	!UN
1991 OCT	.	BDL	BDL	.	.	10,000 <T	.
1991 NOV	.	BDL	.	!NR	.	.	.
1992 JAN	.	.	BDL	.	BDL	BDL	BDL
1992 FEB	BDL	.	.	.	.	BDL	BDL
1992 MAY	BDL	BDL	.	.	.	BDL	BDL
1992 DEC	.	.	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
PESTICIDES AND PCB							
ALDRIN (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 700 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALPHA BHC (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 700 (G)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BETA BHC (NG/L)		DET'N LIMIT = 1.00		GUIDELINE = 300 (G)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
LINDANE (GAMMA BHC) (NG/L)		DET'N LIMIT = 1.000		GUIDELINE = 4000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ALPHA CHLORDANE (NG/L)		DET'N LIMIT = 2.000		GUIDELINE = 7000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
GAMMA CHLORDANE (NG/L)		DET'N LIMIT = 2.00		GUIDELINE = 7000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DIELDRIN (NG/L)		DET'N LIMIT = 2.00		GUIDELINE = 700 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
METHOXYCHLOR (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = 900000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDOSULFAN 1 (NG/L)		DET'N LIMIT = 2.00		GUIDELINE = 74000 (D4)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDOSULFAN 11 (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 74000 (D4)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDRIN (NG/L)		DET'N LIMIT = 5.000		GUIDELINE = 1600 (D3)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ENDOSULFAN SULPHATE (NG/L)		DET'N LIMIT = 5.00		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4 .
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
PESTICIDES AND PCB							
HEPTACHLOR EPOXIDE (NG/L)							
		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)			
22 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
HEPTACHLOR (NG/L)							
		DET'N LIMIT = 1.000		GUIDELINE = 3000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
MIREX (NG/L)							
		DET'N LIMIT = 5.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
OXYCHLORDANE (NG/L)							
		DET'N LIMIT = 2.000		GUIDELINE = N/A			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
O,P-DDT (NG/L)							
		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PCB (NG/L)							
		DET'N LIMIT = 20.00		GUIDELINE = 3000 (A2)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
P,P-DDD (NG/L)							
		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
P,P-DDE (NG/L)							
		DET'N LIMIT = 1.000		GUIDELINE = 30000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
P,P-DDT (NG/L)							
		DET'N LIMIT = 5.000		GUIDELINE = 30000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TOXAPHENE (NG/L)							
		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A1)			
37 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
AMETRINE (NG/L)							
		DET'N LIMIT = 50.0		GUIDELINE = 300000 (D3)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOME ST FREE FLOW
PESTICIDES AND PCB							
ATRAZINE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 60000 (A2)			
1991 MAY	.	.	BDL	BDL	.	BDL	.
1991 JUN	.	IAW	.	.	.	IAW	.
1991 JUL	.	.	IAW	IAW	.	IAW	IAW
1991 AUG	.	.	IAW	IAW	.	IAW	.
1991 SEP	.	.	IAW	IAW	.	IAW	.
1991 OCT	.	.	IAW	IAW	.	IAW	.
1991 NOV	.	.	BDL	BDL	.	.	.
1992 JAN	.	.	BDL	.	BDL	BDL	.
1992 FEB	BDL	.	.	.	.	BDL	.
1992 MAY	BDL	BDL	.	.	.	BDL	.
1992 AUG	.	BDL	.	BDL	BDL	BDL	.
1992 DEC	.	.	BDL	BDL	70,000 <T	BDL	.
ATRATONE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	IAW
CYANAZINE (BLADEX) (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 10000 (A2)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	IAW
DESETHYL ATRAZINE (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = 60000 (A2)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	IAW
DESETHYL SIMAZINE (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = 10000 (A2)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	IAW
PROMETONE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 52500 (D3)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	IAW
PROPACINE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 700000 (D3)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	IAW
PROMETRYNE (NG/L)		DET'N LIMIT = 50.000		GUIDELINE = 1000 (A2)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	IAW
METRIBUZIN (SENCOR) (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 80000 (A1)			
19 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	IAW

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
PESTICIDES AND PCB							
SIMAZINE (NG/L)		DET'N LIMIT = 50.00		GUIDELINE = 10000 (A2)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	!AW
ALACHLOR (LASSO) (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 5000 (A2)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	!AW
METOLACHLOR (NG/L)		DET'N LIMIT = 500.0		GUIDELINE = 50000 (A2)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	!AW
HEXACLOCYCLOPENTADIEN (NG/L)		DET'N LIMIT = 5.00		GUIDELINE = 206000 (D4)			
23 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
PHENOLICS							
PHENOLICS (UG/L)		DET'N LIMIT = 0.2		GUIDELINE = N/A			
1991 MAY	.	BDL	.	.	.400 <T	BDL	.
1991 JUN	BDL	.	BDL	.	.	BDL	.
1991 JUL	.	.400 <T	.	.	.400 <T	.400 <T	.
1991 AUG	.	BDL	.	.	.400 <T	BDL	.
1991 SEP	.	.600 <T	.	.	BDL	.600 <T	.
1991 OCT	.	BDL	.400 <T	.	.	BDL	.
1991 NOV	.	BDL	.	BDL	.	.	.
1992 JAN	.	.	BDL	.	BDL	BDL	.
1992 FEB	.400 <T	.	.	.	.	BDL	.
1992 MAY	BDL	BDL	.	.	.	BDL	.
1992 AUG	.	1.000 <T	.	.	.	BDL	.
1992 DEC	.	.	BDL	.	BDL	.400 <T	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOME ST FREE FLOW
POLYAROMATIC HYDROCARBONS							
PHENANTHRENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ANTHRACENE (NG/L)		DET'N LIMIT = 1.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
FLUORANTHRENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = 42000 (D4)			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PYRENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BENZO(A)ANTHRACENE (NG/L)		DET'N LIMIT = 20.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CHRYSENE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DIMETH. BENZ(A)ANTHR (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BENZO(E) PYRENE (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BENZO(B) FLUORANTHREN (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
PERYLENE (NG/L)		DET'N LIMIT = 10.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BENZO(K) FLUORANTHREN (NG/L)		DET'N LIMIT = 1.0		GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BENZO(A) PYRENE (NG/L)		DET'N LIMIT = 5.0		GUIDELINE = 10 (A1)			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
POLYAROMATIC HYDROCARBONS							
BENZO(G,H,I) PERYLENE (NG/L)				GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DIBENZO(A,H) ANTHRAC (NG/L)				GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
INDENO(1,2,3-C,D) PY (NG/L)				GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BENZO(B) CHRYSENE (NG/L)				GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CORONENE (NG/L)				GUIDELINE = N/A			
8 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RÉSERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
SPECIFIC PESTICIDES							
2,4,5-T (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 280000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
2,4-D (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = 100000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
2,4-DB (NG/L)		DET'N LIMIT = 200.0		GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
2,4 D PROPIONIC ACID (NG/L)		DET'N LIMIT = 100.0		GUIDELINE = N/A			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
DICAMBA (NG/L)		DET'N LIMIT = 50.0		GUIDELINE = 120000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.
PICHLORAM (NG/L)		DET'N LIMIT = 100.00		GUIDELINE = 190000 (A2)			
6 SAMPLES	INP	INP	BDL	INP	BDL	INP	.
2,4,5-TP (SILVEX) (NG/L)		DET'N LIMIT = 20.00		GUIDELINE = 10000 (A1)			
32 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	.

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOME ST FREE FLOW
VOLATILES							
BENZENE (UG/L)	BDL	BDL	BDL	BDL	BDL	BDL	BDL
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TOLUENE (UG/L)							
1991 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ETHYLBENZENE (UG/L)							
1991 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
P-XYLENE (UG/L)							
1991 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
M-XYLENE (UG/L)							
1991 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991* AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
VOLATILES							
O-XYLENE (UG/L)	DET'N LIMIT = 0.05		GUIDELINE = 300 (A3*)				
1991 MAY	.	BDL	BDL	.	BDL	BDL	BDL
1991 JUN	.	BDL	.	BDL	.	BDL	BDL
1991 JUL	.	.	BDL	.	BDL	BDL	BDL
1991 AUG	.	.	BDL	.	BDL	BDL	BDL
1991 SEP	.	.	BDL	.	BDL	BDL	BDL
1991 OCT	.	.	BDL	.	.	BDL	BDL
1991 NOV	.	.	BDL	.	.	.050 <T	BDL
1992 JAN	.	.	BDL	.	BDL	BDL	BDL
1992 FEB	.	.	.	.	.	BDL	.
1992 MAY	.	BDL	.	.	.	BDL	BDL
1992 AUG	.	BDL	.	BDL	BDL	BDL	BDL
1992 DEC	.	.	BDL	BDL	BDL	BDL	BDL
STYRENE (UG/L)							
DET'N LIMIT = 0.05		GUIDELINE = 100 (D1)					
1991 MAY	.	.100 <T	.100 <T	.	.050 <T	BDL	BDL
1991 JUN	.	.	.	.	.	.050 <T	BDL
1991 JUL	.	.	BDL	.	BDL	BDL	BDL
1991 AUG	.	.	BDL	.	.150 <T	BDL	BDL
1991 SEP	.	.	BDL	.	.150 <T	.100 <T	BDL
1991 OCT	.	.	BDL	.	.	BDL	BDL
1991 NOV	.	.	.100 <T	.	.150 <T	.100 <T	.200 <T
1992 JAN	.	.	.	.	.	.050 <T	.250 <T
1992 FEB	.	.	.100 <T	.	.	.100 <T	.
1992 MAY	.	.200 <T	.100 <T	.	.	BDL	.100 <T
1992 AUG	.	.	BDL	.	BDL	BDL	BDL
1992 DEC	.	.	BDL	.050 <T	.100 <T	.050 <T	.100 <T
1,1-DICHLOROETHYLENE (UG/L)							
DET'N LIMIT = 0.100		GUIDELINE = 7 (D1)					
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
METHYLENE CHLORIDE (UG/L)							
DET'N LIMIT = 0.50		GUIDELINE = 50 (A1)					
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
VOLATILES							
112-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 70 (D1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,1-DICHLOROETHANE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = N/A				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CHLOROFORM (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
111, TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.02	GUIDELINE = 200 (D1)				
1991 MAY		BDL		.040 <T		BDL	BDL
1991 JUN	BDL	BDL				BDL	BDL
1991 JUL		BDL		BDL		BDL	BDL
1991 AUG		BDL		BDL		BDL	BDL
1991 SEP		BDL		BDL		BDL	BDL
1991 OCT		BDL				BDL	BDL
1991 NOV		BDL		BDL		BDL	BDL
1992 JAN					.080 <T	BDL	BDL
1992 FEB						BDL	BDL
1992 MAY	BDL	BDL				BDL	BDL
1992 AUG		BDL		BDL	BDL	.060 <T	BDL
1992 DEC			BDL	.040 <T	BDL	.040 <T	BDL
1,2 DICHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 5 (A1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CARBON TETRACHLORIDE (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 5 (A1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-DICHLOROPROPANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 5 (D1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TRICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 50 (A1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
DICHLOROBROMOMETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 350 (A1+)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
VOLATILES							
112-TRICHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 0.6 (D4)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CHLORODIBROMOMETHANE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 350 (A1+)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TETRACHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 65 (A5)				
1991 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1991 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JAN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 FEB	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 APR	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 MAY	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUN	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 JUL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 AUG	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 SEP	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 OCT	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 NOV	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1992 DEC	BDL	BDL	BDL	BDL	BDL	BDL	BDL
BROMOFORM (UG/L)		DET'N LIMIT = 0.20	GUIDELINE = 350 (A1+)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1122-TETACHLOROETHANE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 0.17 (D4)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
VINYL CHLORIDE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 2 (D1)				
15 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
C12-DICHLOROETHYLENE (UG/L)		DET'N LIMIT = 0.100	GUIDELINE = 70 (D1)				
15 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
CHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 1510 (D3)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,4-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 5 (A1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOME ST FREE FLOW
VOLATILES							
1,3-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.10	GUIDELINE = 3750 (D3)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
1,2-DICHLOROBENZENE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 200 (A1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
ETHYLENE DIBROMIDE (UG/L)		DET'N LIMIT = 0.05	GUIDELINE = 50 (D1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TOTL TRIHALOMETHANES (UG/L)		DET'N LIMIT = 0.50	GUIDELINE = 350 (A1)				
47 SAMPLES	BDL	BDL	BDL	BDL	BDL	BDL	BDL

TABLE 4
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992 MARATHON WELL SUPPLY

WELL 1 RAW	WELL 2 RAW	WELL 3 RAW	WELL 4 RAW	WELL 5 RAW	WELL 6 RAW	RESERVOIR TREATED	DIST. SYSTEM HOWE ST FREE FLOW
RADIONUCLIDES							
COBALT 60 (BQ/L)	DET'N LIMIT = 0.70		GUIDELINE = N/A				
7 SAMPLES	.	BDL	BDL	BDL	BDL	BDL	.
CESIUM 134 (BQ/L)	DET'N LIMIT = 0.70		GUIDELINE = N/A				
7 SAMPLES	.	BDL	BDL	BDL	BDL	BDL	.
CESIUM 137 (BQ/L)	DET'N LIMIT = 0.70		GUIDELINE = 50 (A1)				
7 SAMPLES	.	BDL	BDL	BDL	BDL	BDL	.
GROSS ALPHA COUNT (BQ/L)	DET'N LIMIT = 0.04		GUIDELINE = 0.55 (D1)				
1991 MAY	.	.050	BDL	BDL	BDL	BDL	.
1992 DEC	.	.	BDL	BDL	BDL	BDL	.
GROSS BETA COUNT (BQ/L)	DET'N LIMIT = 0.04		GUIDELINE = N/A				
1991 MAY	.	.110	.060	.080	.070	.080	.
1992 DEC	.	.	.	.060	.	.070	.
TRITIUM (BQ/L)	DET'N LIMIT = 7.00		GUIDELINE = 40000 (A1)				
7 SAMPLES	.	BDL	BDL	BDL	BDL	BDL	.
IODINE 131 (BQ/L)	DET'N LIMIT = 0.70		GUIDELINE = 10 (A1)				
7 SAMPLES	.	BDL	BDL	BDL	BDL	BDL	.

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER -----	UNIT ----	DETECTION LIMIT -----	GUIDELINE -----
BACTERIOLOGICAL			
FECAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	0 (A1)
STANDARD PLATE COUNT MEMBRANE FILT.	CT/ML	0	500/ML (A3)
TOTAL COLIFORM BACKGROUND MF	CT/100ML	0	N/A
TOTAL COLIFORM MEMBRANE FILTRATION	CT/100ML	0	5/100ML (A1)
CHEMISTRY (FLD)			
FIELD COMBINED CHLORINE RESIDUAL	MG/L	0	N/A
FIELD TOTAL CHLORINE RESIDUAL	MG/L	0	N/A
FIELD FREE CHLORINE RESIDUAL	MG/L	0	N/A
FIELD PH	DMNSLESS	N/A	6.5-8.5 (A4)
FIELD TEMPERATURE	DEG.C	N/A	15.0 (A3)
FIELD TURBIDITY	FTU	N/A	1.0 (A1)
CHEMISTRY (LAB)			
ALKALINITY	MG/L	0.20	30-500 (A4)
AMMONIUM TOTAL	MG/L	0.002	0.05 (F2)
CALCIUM	MG/L	0.20	100.0 (F2)
CHLORIDE	MG/L	0.20	250.0 (A3)
COLOUR	TCU	0.50	5.0 (A3)
CONDUCTIVITY	UMHO/CM	1.00	400.0 (F2)
CYANIDE	MG/L	0.001	0.2 (A1)
DISSOLVED ORGANIC CARBON	MG/L	0.10	5.0 (A3)
FLUORIDE	MG/L	0.01	1.5* (A1)
HARDNESS	MG/L	0.50	80-100 (A4)
IONCAL	DMNSLESS	N/A	N/A
LANGELIERS INDEX	DMNSLESS	N/A	N/A
MAGNESIUM	MG/L	0.10	30.0 (F2)
NITRATES (TOTAL)	MG/L	0.005	10.0 (A1)
NITRITE	MG/L	0.001	1.0 (A1)
NITROGEN TOTAL KJELDAHL	MG/L	0.02	N/A
PH	DMNSLESS	N/A	6.5-8.5 (A4)
PHOSPHORUS FIL REACT	MG/L	0.0005	N/A
PHOSPHORUS TOTAL	MG/L	0.002	0.4 (F2)
POTASSIUM	MG/L	0.010	10.0 (F2)
RESIDUE FILTRATE (CALCULATED TDS)	MG/L	N/A	500.0 (A3)
SODIUM	MG/L	0.20	200.0 (A4)
SULPHATE	MG/L	0.20	500.0 (A4)
TURBIDITY	FTU	0.05	1.0 (A1)
* The Maximum Acceptable Concentration (MAC) for <u>naturally occurring fluoride</u> in drinking water is 2.4 mg/L.			
CHLOROAROMATICS			
1,2,3-TRICHLOROBENZENE	NG/L	5.0	N/A
1,2,3,4-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,3,5-TETRACHLOROBENZENE	NG/L	1.0	N/A
1,2,4-TRICHLOROBENZENE	NG/L	5.0	10000 (1)
1,2,4,5-TETRACHLOROBENZENE	NG/L	1.0	38000 (D4)
1,3,5-TRICHLOROBENZENE	NG/L	5.0	N/A
2,3,6-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,4,5-TRICHLOROTOLUENE	NG/L	5.0	N/A
2,6A-TRICHLOROTOLUENE	NG/L	5.0	N/A
HEXACHLOROBENZENE (HCB)	NG/L	1.0	10 (C1)
HEXACHLOROBUTADIENE	NG/L	1.0	450 (D4)
HEXACHLOROETHANE	NG/L	1.0	1900 (D4)
OCTACHLOROSTYRENE	NG/L	1.0	N/A
PENTACHLOROBENZENE	NG/L	1.0	74000 (D4)
CHLOROPHENOLS			
2,3,4-TRICHLOROPHENOL	NG/L	100.0	N/A
2,3,4,5-TETRACHLOROPHENOL	NG/L	20.0	N/A
2,3,5,6-TETRACHLOROPHENOL	NG/L	10.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
2,4,5-TRICHLOROPHENOL	NG/L	100.0	2600000 (D4)
2,4,6-TRICHLOROPHENOL	NG/L	20.0	5000 (A1)
PENTACHLOROPHENOL	NG/L	10.0	60000 (A1)
METALS			
ALUMINUM	UG/L	0.10	100 (A4)
ANTIMONY	UG/L	0.05	146 (D4)
ARSENIC	UG/L	0.10	25 (A1)
BARIUM	UG/L	0.05	1000 (A2)
BERYLLIUM	UG/L	0.05	6800 (D4)
BORON	UG/L	2.00	5000 (A1)
CADMIUM	UG/L	0.05	5 (A1)
CHROMIUM	UG/L	0.50	50 (A1)
COBALT	UG/L	0.02	N/A
COPPER	UG/L	0.50	1000 (A3)
IRON	UG/L	6.00	300 (A3)
LEAD	UG/L	0.05	10 (A1)
MANGANESE	UG/L	0.05	50 (A3)
MERCURY	UG/L	0.02	1 (A1)
MOLYBDENUM	UG/L	0.05	N/A
NICKEL	UG/L	0.20	350 (D3)
SELENIUM	UG/L	1.00	10 (A1)
SILVER	UG/L	0.05	N/A
STRONTIUM	UG/L	0.10	N/A
THALLIUM	UG/L	0.05	13 (D4)
TITANIUM	UG/L	0.50	N/A
URANIUM	UG/L	0.05	100 (A1)
VANADIUM	UG/L	0.05	N/A
ZINC	UG/L	0.20	5000 (A3)
POLYNUCLEAR AROMATIC HYDROCARBONS			
ANTHRACENE	NG/L	1.0	N/A
BENZO(A) ANTHRACENE	NG/L	20.0	N/A
BENZO(A) PYRENE	NG/L	5.0	10 (A1)
BENZO(B) CHRYSENE	NG/L	2.0	N/A
BENZO(B) FLUORANTHENE	NG/L	10.0	N/A
BENZO(E) PYRENE	NG/L	50.0	N/A
BENZO(G,H,I) PERYLENE	NG/L	20.0	N/A
BENZO(K) FLUORANTHENE	NG/L	1.0	N/A
CHRYSENE	NG/L	50.0	N/A
CORONENE	NG/L	10.0	N/A
DIBENZO(A,H) ANTHRACENE	NG/L	10.0	N/A
DIMETHYL BENZO(A) ANTHRACENE	NG/L	5.0	N/A
FLUORANTHENE	NG/L	20.0	42000 (D4)
INDENO(1,2,3-C,D) PYRENE	NG/L	20.0	N/A
PERYLENE	NG/L	10.0	N/A
PHENANTHRENE	NG/L	10.0	N/A
PYRENE	NG/L	20.0	N/A
PESTICIDES & PCB			
ALACHLOR (LASSO)	NG/L	500.0	5000 (A2)
ALORIN	NG/L	1.0	700 (A1)
ALPHA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	700 (G)
ALPHA CHLORDANE	NG/L	2.0	7000 (A1)
AMETRINE	NG/L	50.0	300000 (D3)
ATRATONE	NG/L	50.0	N/A
ATRAZINE	NG/L	50.0	60000 (A2)
DESETHYL ATRAZINE	NG/L	200.0	60000 (A2)
BETA HEXACHLOROCYCLOHEXANE (BHC)	NG/L	1.0	300 (G)
CYANAZINE (BLADEx)	NG/L	100.0	10000 (A2)
DIELDRIN	NG/L	2.0	700 (A1)
ENDOSULFAN 1 (THIODAN I)	NG/L	2.0	74000 (D4)
ENDOSULFAN 2 (THIODAN II)	NG/L	5.0	74000 (D4)
ENDOSULFAN SULPHATE (THIODAN SULPHATE)	NG/L	5.0	N/A

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
-----	----	-----	-----
ENDRIN	NG/L	5.0	1600 (D3)
GAMMA CHLORDANE	NG/L	2.0	7000 (A1)
HEPTACHLOR	NG/L	1.0	3000 (A1)
HEPTACHLOR EPOXIDE	NG/L	1.0	3000 (A1)
HEXACHLOROCYCLOPENTADIENE	NG/L	5.0	206000 (D4)
LINDANE (GAMMA BHC)	NG/L	1.0	4000 (A1)
METHOXYCHLOR	NG/L	5.0	900000 (A1)
METOLACHLOR	NG/L	500.0	50000 (A2)
METRIBUZIN (SENCOR)	NG/L	100.0	80000 (A1)
MIREX	NG/L	5.0	N/A
P,P-DDD	NG/L	5.0	30000 (A1)
O,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDT	NG/L	5.0	30000 (A1)
P,P-DDE	NG/L	1.0	30000 (A1)
OXYCHLORDANE	NG/L	2.0	N/A
PCB	NG/L	20.0	3000 (A2)
PROMETONE	NG/L	50.0	52500 (D3)
PROMETRYNE	NG/L	50.0	1000 (A2)
PROPAZINE	NG/L	50.0	700000 (D3)
SIMAZINE	NG/L	50.0	10000 (A2)
DESETHYL SIMAZINE	NG/L	200.0	10000 (A2)
TOXAPHENE	NG/L	500.0	5000 (A1)
PHENOLICS			
PHENOLICS (UNFILTERED REACTIVE)	UG/L	0.2	N/A
SPECIFIC PESTICIDES			
2,4 D PROPIONIC ACID	NG/L	100.0	N/A
2,4,5-TRICHLOROPHENOXY ACETIC ACID	NG/L	50.0	280000 (A1)
2,4-DICHLOROBUTYRIC ACID (2,4-D)	NG/L	100.0	100000 (A1)
2,4-DICHLOROPHENOXYBUTYRIC ACID (2,4-DB)	NG/L	200.0	N/A
2,4,5-TP (SILVEX)	NG/L	20.0	10000 (A1)
BUTYLATE (SUTAN)	NG/L	2000.0	245000 (D3)
CARBARYL (SEVIN)	NG/L	200.0	90000 (A1)
CARBOFURAN	NG/L	2000.0	90000 (A1)
CHLORPROPHAM (CIPC)	NG/L	2000.0	350000 (G)
CHLORPYRIFOS (DURSABAN)	NG/L	20.0	N/A
DIALATE	NG/L	2000.0	N/A
DIAZINON	NG/L	20.0	20000 (A1)
DICAMBA	NG/L	50.0	120000 (A1)
DICHLOROVOS	NG/L	20.0	N/A
EPTAM	NG/L	2000.0	N/A
ETHION	NG/L	20.0	35000 (G)
IPC	NG/L	2000.0	N/A
MALATHION	NG/L	20.0	190000 (A1)
METHYL PARATHION	NG/L	50.0	9000 (D3)
METHYLTRITHION	NG/L	20.0	N/A
MEVINPHOS	NG/L	20.0	N/A
PARATHION	NG/L	20.0	50000 (A1)
PHORATE (THIMET)	NG/L	20.0	2000 (A2)
PICHLORAM	NG/L	100.0	190000 (A2)
PROPOXUR (BAYGON)	NG/L	2000.0	140000 (D3)
RELDAN	NG/L	20.0	N/A
RONNEL	NG/L	20.0	N/A
VOLATILES			
1,1-DICHLOROETHANE	UG/L	0.10	N/A
1,1-DICHLOROETHYLENE	UG/L	0.10	7 (D1)
1,2-DICHLOROBENZENE	UG/L	0.05	200 (A1)
1,2-DICHLOROETHANE	UG/L	0.05	5 (A1)
1,2-DICHLOROPROPANE	UG/L	0.05	5 (D1)
1,3-DICHLOROBENZENE	UG/L	0.10	3750 (D3)
1,4-DICHLOROBENZENE	UG/L	0.10	5 (A1)
1,1,1-TRICHLOROETHANE	UG/L	0.02	200 (D1)
1,1,2-TRICHLOROETHANE	UG/L	0.05	0.6 (D4)
1,1,2,2-TETRACHLOROETHANE	UG/L	0.05	0.17 (D4)

TABLE 5
DRINKING WATER SURVEILLANCE PROGRAM 1991 AND 1992

SCAN/PARAMETER	UNIT	DETECTION LIMIT	GUIDELINE
BENZENE	UG/L	0.05	5 (A1)
BROMOFORM	UG/L	0.20	350 (A1+)
CARBON TETRACHLORIDE	UG/L	0.20	5 (A1)
CHLOROBENZENE	UG/L	0.10	1510 (D3)
CHLORODIBROMOMETHANE	UG/L	0.10	350 (A1+)
CHLOROFORM	UG/L	0.10	350 (A1+)
CIS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
DICHLOROBROMOMETHANE	UG/L	0.05	350 (A1+)
ETHYLENE DIBROMIDE	UG/L	0.05	50 (D1)
ETHYLBENZENE	UG/L	0.05	2.4 (A3)
M-XYLENE	UG/L	0.10	300 (A3*)
METHYLENE CHLORIDE	UG/L	0.50	50 (A1)
O-XYLENE	UG/L	0.05	300 (A3*)
P-XYLENE	UG/L	0.10	300 (A3*)
STYRENE	UG/L	0.05	100 (D1)
TETRACHLOROETHYLENE	UG/L	0.05	65 (A5)
TRANS 1,2-DICHLOROETHYLENE	UG/L	0.10	70 (D1)
TOLUENE	UG/L	0.05	24 (A3)
TOTAL TRIHALOMETHANES	UG/L	0.50	350 (A1)
TRICHLOROETHYLENE	UG/L	0.10	50 (A1)
VINYL CHLORIDE	UG/L	0.10	2 (D1)
RADIONUCLIDES			
TRITIUM	BQ/L	7.0	40000 (A1)
GROSS ALPHA COUNT	BQ/L	0.04	0.55# (D1)
GROSS BETA COUNT	BQ/L	0.04	N/A
COBALT 60	BQ/L	0.70	N/A
CESIUM 134	BQ/L	0.70	N/A
CESIUM 137	BQ/L	0.70	50 (A1)
IODINE 131	BQ/L	0.70	10 (A1)

Equal to 15.0 Picocuries/litre

DRINKING WATER SURVEILLANCE PROGRAM
PROGRAM DESCRIPTION

The Drinking Water Surveillance Program (DWSP) for Ontario monitors drinking water quality at municipal water supply systems. The DWSP Database Management System provides a computerized drinking water quality information system for the supplies monitored. The objectives of the program are to provide:

- immediate, reliable, current information on drinking water quality;
- a flagging mechanism for guideline exceedance;
- a definition of contaminant levels and trends;
- a comprehensive background for remedial action;
- a framework for assessment of new contaminants; and
- an indication of treatment efficiency of plant processes.

PROGRAM

The DWSP officially began in April 1986 and is designed to eventually include all municipal water supplies in Ontario. In 1992, 109 systems were being monitored. Water supply locations have been prioritized for surveillance based primarily on criteria such as population density, probability of contamination and geographical location.

An ongoing assessment of future monitoring requirements at each location will be made. Monitoring will continue at the initial locations at an appropriate level and further locations will be phased into the program as resources permit.

A major goal of the program is to collect valid water quality data in context with plant operational characteristics at the time of sampling. As soon as sufficient data have been accumulated and analyzed, both the frequency of sampling and the range of parameters may be adjusted accordingly.

Assessments are carried out at all locations prior to initial sampling, in order to acquire complete plant process and distribution system details and to designate (and retrofit if necessary) all sampling systems and locations. This ensures that the sampled water is a reflection of the water itself.

Samples are taken of raw (ambient water) and treated water at the treatment plant and of consumer's tap water in the distribution system. In order to determine possible effects of distribution on water quality, both standing and free flow water in old and new sections of the distribution system are sampled. Sampling is carried out by operational personnel who have been trained in applicable procedures.

Comprehensive standardized procedures and field test kits are supplied to sampling personnel. This ensures that samples are taken and handled according to standard protocols and that field testing will supply reliable data. All field and laboratory analyses are carried out using "approved documented procedures". Most laboratory analyses are carried out by the Ministry of Environment and Energy (MOEE), Laboratory Services Branch. Radionuclides are analyzed by the Ministry of Labour.

DATA REPORTING MECHANISM

When the analytical results are transferred from the MOEE laboratory into the DWSP system, printouts of the completed analyses are sent to the MOEE District Officer, the appropriate operational staff and are also retained by the DWSP unit.

PROGRAM INPUTS AND OUTPUTS

There are four major inputs and four major outputs in the program.

Program Input - Plant and Distribution System Description

The system description includes plant specific non-analytical information acquired through a questionnaire and an initial plant visit. During the initial assessment of the plant and distribution system, questionnaire content is verified and missing information added. It is intended that all data be kept current with scheduled annual updates.

The Plant and Distribution System Description consists of the following seven components:

1. PROCESS COMPONENT INVENTORY

All physical and chemical processes to which the water is subjected, from the intake pipe to the consumers' tap (where possible), are documented. These include: process type, general description of physical structures, material types, sizes, and retention time for each process within the plant. The processes may be as simple as transmission or as complex as carbon adsorption.

2. TREATMENT CHEMICALS

Chemicals used in the treatment processes, their function, application point, supplier and brand-name are recorded. Chemical dosages applied on the day of sampling are recorded in DWSP.

3. PROCESS CONTROL MEASUREMENTS

Documentation of in-plant monitoring of process parameters (eg. turbidity, chlorine residuals, pH, aluminum residuals) including methods used, monitoring locations and frequency is contained in this section. Except for the recorded Field Data, in-plant monitoring results are not retained in DWSP but are retained by the water treatment plant personnel.

4. DESIGN FLOW AND RETENTION TIME

Hydraulic capacity, designed and actual, is noted here. Retention time (the time that a block of water is retained in the plant) is also noted. Maximum, minimum and average flow, as well as a record of the flow rate on the day of sampling, are recorded in DWSP.

5. DISTRIBUTION SYSTEM DESCRIPTION

This area includes the storage and transmission characteristics of the distribution system after the water leaves the plant.

6. SAMPLING SYSTEM

Each plant is assessed for its adequacy in terms of the sampling of bacteriological, organic and inorganic parameters. Prime considerations in the assessment and design of the sampling system are:

- i/ the sample is an accurate representation of the actual water condition, eg. raw water has had no chemical treatment;
- ii/ the water being sampled is not being modified by the sampling system;
- iii/ the sample tap must be in a clean area of the plant, preferably a lab area; and
- iv/ the sample lines must be organically inert (no plastic, ideally stainless steel).

It is imperative that the sampled water be a reflection not of the sampling system but of the water itself.

The sampling system documentation includes: origin of the water; date sampling was initiated; size, length and material type (intake, discharge and tap); pump characteristics (model, type, capacity); and flow rate.

7. PERSONNEL

This section contains the names, addresses and phone numbers of current plant management and operational staff, distribution system management and operational staff, Medical Officer of Health and appropriate MOEE personnel associated with the plant.

Program Input - Field Data

The second major input to DWSP is field data. Field data is collected at the plant and from the distribution system sites on the day of sampling. Field data consists of general operating conditions and the results of testing for field parameters. General operating conditions include chemicals used, dosages, flow and retention time on the day of sampling, as well as, monthly maximum, minimum and average flows. Field parameters include turbidity, chlorine residuals (free, combined and total), temperature and pH. These parameters are analyzed according to standardized DWSP protocols to allow for interplant comparison.

Program Input - Laboratory Analytical Data

The third major input to DWSP is Laboratory Analytical Data. Samples gathered from the raw, treated and distribution sampling sites are analyzed for the presence of approximately 180 parameters at a frequency of two to twelve times per year. Sixty-five percent of the parameters are organic. Parameters measured may have health or aesthetic implications when present in drinking water. Many of the parameters may be used in the treatment process or may be treatment by-products. Due to the nature of certain analytical instruments, parameters may be measured in a "scan" producing some results for parameters that are not on the DWSP priority list, but which may be of interest. The majority of parameters are measured on a routine basis. Those that are technically more difficult and/or costly to analyze, however, are done less frequently. These include Specific Pesticides and Chlorophenols.

Although the parameter list is extensive, additional parameters with the potential to cause health or aesthetic related problems may be added provided reliable analytical and sampling methods exist.

All laboratory generated data is derived from standardized, documented analytical protocols. The analytical method is an integral part of the data and as methods change, notation will be made and comparison data documented.

Program Input - Parameter Reference Information

The fourth major input to DWSP is Parameter Reference Information. This is a catalogue of information for each substance analyzed on DWSP. It includes parameter name and aliases, physical and chemical properties, basic toxicology, world-wide health limits, treatment methods and uses. The Parameter Reference Information is computerized and can be accessed through the Query function of the DWSP database. An example is shown in figure 1.

Program output - Query

All DWSP information is easily accessed through the Query function, therefore, anything from addresses of plant personnel to complete water quality information for a plant's water supply is instantly available. The DWSP computer system makes relatively complex inquiries manageable. A personal password allowing access into the DWSP query mode in all MOEE offices is being developed by the DWSP group.

Program Output - Action Alerts

Drinking Water quality in Ontario is evaluated against provincial objectives as outlined in the Ontario Drinking Water Objectives publication. Should the reported level of a substance in treated water exceed the Ontario Drinking Water Objective, an "Action Alert" requiring resampling and confirmation is issued. This assures that operational staff, health authorities and the public are notified as soon as possible of the confirmation of an exceedance and remedial action taken. This report supplies a history of the occurrence of past exceedances at the plant plus a historical summary on the parameter of concern.

In the absence of Ontario Drinking Water Objectives, guidelines/limits from other agencies are used. The Parameter Listing System, published by MOEE (ISBN 0-7729-4461-X), catalogues and keeps current guidelines for 650 parameters from agencies throughout the world. If these guidelines are exceeded, the results are flagged and evaluated by DWSP personnel. An "Action Alert" will be issued if warranted.

Program Output - Report Generation

Custom reports can be generated from DWSP to meet MOEE Regional needs and to respond to public requests.

Program Output - Annual Reports

It is the practice of DWSP to produce an annual report containing analytical data along with companion plant information.

FIG.1

PARAMETER REFERENCE INFORMATION

NAME: BENZENE

CAS#: 71-43-2

MOLECULAR FORMULAE: C_6H_6

DETECTION LIMIT: (FOR METHOD POCODO) 0.05 $\mu g/L$

SYNONYMS: BENZOL; BENZOLE; COAL NAPHTHA; CARBON OIL (27)
CYCLOHEXATRIENE (41)

CHARACTERISTICS: COLOURLESS TO LIGHT-YELLOW, MOBILE, NONPOLAR LIQUID, OF
HIGHLY REFRACTIVE NATURE, AROMATIC ODOUR; VAPOURS BURN
WITH SMOKING FLAME (30)

PROPERTIES: SOLUBILITY IN WATER: 1780-1800 mg/L AT 25C (41)
THRESHOLD ODOUR: 0.5 - 10 PPM IN WATER
THRESHOLD TASTE: 0.5 mg/L IN WATER (39)
ENVIRONMENTAL FATE: MAY BIOACCUMULATE IN LIVING ORGANISMS
AND APPEARS TO ACCUMULATE IN ANIMAL TISSUES THAT EXHIBIT
A HIGH LIPID CONTENT OR REPRESENT MAJOR METABOLIC SITES,
SUCH AS LIVER OR BRAIN; SMALL QUANTITIES EVAPORATE FROM
SOILS OR ARE DEGRADED RATHER QUICKLY (80)

SOURCES: COMMERCIAL: PETROLEUM REFINING; SOLVENT RECOVERY; COAL TAR
DISTILLATION (39); FOOD PROCESSING AND TANNING INDUSTRIES;
COMBUSTION OF CAR EXHAUST.
ENVIRONMENTAL: POSSIBLE SOURCE IS RUNOFF.

USES: DETERGENTS; NYLON; INTERMEDIATE IN PRODUCTION OF OTHER
COMPOUNDS, SUCH AS PESTICIDES; SOLVENT FOR EXTRACTION AND
RECTIFICATION IN RUBBER INDUSTRY; DEGREASING AND CLEANSING
AGENT; GASOLINE.

REMOVAL: THE FOLLOWING PROCESSES HAVE BEEN SUCCESSFUL IN REMOVING
BENZENE FROM WASTEWATER: GAC ADSORPTION, PRECIPITATION
WITH ALUM AND SUBSEQUENT REMOVAL VIA SEDIMENTATION,
COAGULATION AND FLOCCULATION, SOLVENT EXTRACTION,
OXIDATION

ADDITIONAL PROPERTIES: MOLECULAR WEIGHT: 78.12
MELTING POINT: 5.5°C (27)
BOILING POINT: 80.1°C (27)
SPECIFIC GRAVITY: 0.8790 AT 20°C (27)
VAPOUR PRESSURE: 100 MM AT 26.1°C (27)
HENRY'S LAW CONSTANT: 0.00555 ATM-M3/MOLE (41)
LOG OCT./WATER PARTITION COEFFICIENT: 1.95 TO 2.13 (39)
CARBON ADSORPTION: K=1.0; 1/N=1.6; R=0.97; PH=5.3 (41)
SEDIMENT/WATER PARTITION COEFFICIENT: NO DATA

DWSP SAMPLING GUIDELINE

i) Raw and Treated at Plant

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-220 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)
Volatiles (duplicates) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle -fill bottle completely without bubbles
Organics (OWOC), (OWTRI)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Specific Pesticides (OWCP), (PEOP), (PECAR)	-as per Organics -three extra bottles must be filled
Polyaromatic hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate
Cyanide (Treated only)	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops sodium hydroxide (NaOH) (Caution: NaOH is corrosive)
Mercury	-250 mL glass bottle -rinse bottle and cap three times -fill to top of label -add 20 drops each nitric acid (HNO_3) and potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$) (Caution: HNO_3 & $\text{K}_2\text{Cr}_2\text{O}_7$ are corrosive)

Phenols	-250 mL glass bottle -do <u>not</u> rinse bottle, preservative has been added -fill to top of label
Radionuclides (as scheduled)	-4 L plastic jug -do <u>not</u> rinse, carrier added -fill to 5 cm from top
Organic Characterization (GC/MS - once per year) (PBVOL), (PBEXT)	-1 L amber glass bottle; instructions as per organic -250 mL glass bottle -do <u>not</u> rinse bottle -fill completely without bubbles

Steps:

1. Let sampling water tap run for an adequate time to clear the sample line.
2. Record time of day on submission sheet.
3. Record temperature on submission sheet.
4. Fill up all bottles as per instructions.
5. Record chlorine residuals (free, combined and total for treated water only), turbidity and pH on submission sheet.
6. No smoking in area of sample location.

ii) Distribution Samples (standing water)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid (HNO_3) (Caution: HNO_3 is corrosive)

Steps:

1. Record time of day on submission sheet.
2. Place bucket under tap and open cold water.
3. Fill to predetermined volume.
4. After mixing the water, record the temperature on the submission sheet.

5. Fill general chemistry and metals bottles.

6. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.

iii) Distribution Samples (free flow)

General Chemistry	-500 mL plastic bottle (PET 500) -rinse bottle and cap with sample water three times -fill to 2 cm from top
Bacteriological	-250 mL plastic bottle with white seal on cap -do <u>not</u> rinse bottle, preservative has been added -avoid touching bottle neck or inside of cap -fill to top of red label as marked
Metals	-500 mL plastic bottle (PET 500) -rinse bottle and cap three times -fill to 2 cm from top -add 10 drops nitric acid HNO_3 (Caution: HNO_3 is corrosive)
Volatiles (duplicate) (OPOPUP)	-45 mL glass vial with septum (teflon side must be in contact with sample) -do <u>not</u> rinse bottle, preservative has been added -fill bottle completely without bubbles
Organics (OWOC)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top
Polyaromatic Hydrocarbons (OAPAHX)	-1 L amber glass bottle per scan -do <u>not</u> rinse bottle -fill to 2 cm from top -add 25 drops of sodium thiosulphate

Steps:

1. Record time of day on submission sheet.

2. Let cold water flow for five minutes.

3. Record temperature on submission sheet.

4. Fill all bottles as per instructions.

5. Record chlorine residuals (free, combined and total), turbidity and pH on submission sheet.



